




GOOD HEALTH

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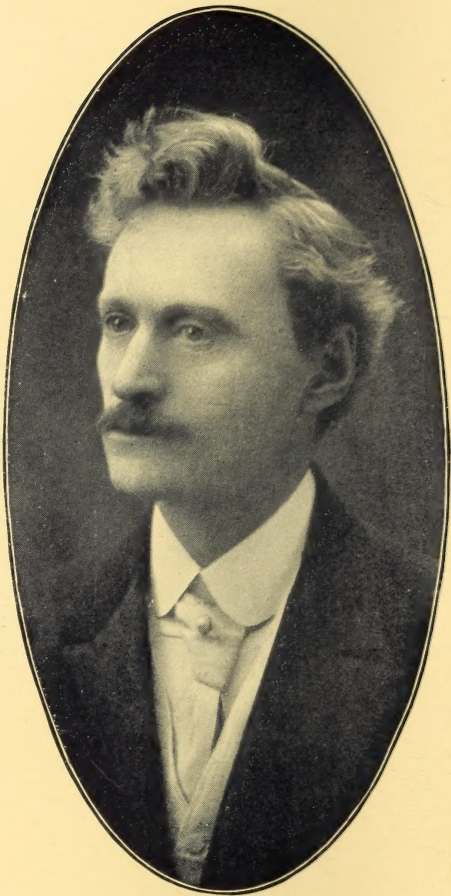
A man works like thunder for
twenty years so that he
might build a mansion,
and then finds that
he was a lot more
comfortable in
a cottage.



W. R. Green, D.D.S.

OTTAWA

President, Ontario Dental Society.

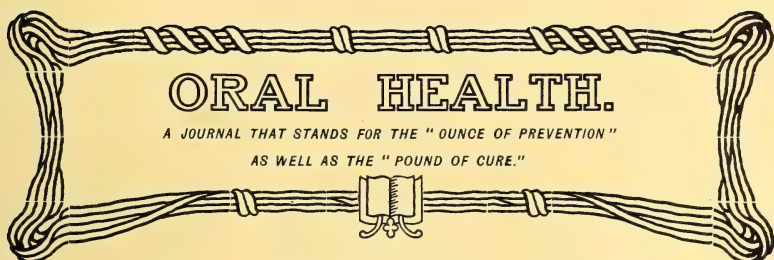


W. D. Cowan, D.D.S.

REGINA

President, Canadian Dental Association.

Dr. COWAN and Dr. GREEN will jointly preside at the Union Meeting of the O.D.S. and C.D.A., at Burlington, 3rd, 4th, 5th, and 6th June, 1912. This Meeting promises to be the most important Dental Convention ever held in Canada.



Vol. 2

TORONTO, JANUARY, 1912.

No. 1.

A FEW NOTES ON GENERAL ANAESTHESIA IN DENTAL PRACTICE.

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Specially written for "Oral Health," by
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—
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—

HUMANITY as a whole is greatly indebted, and the medical profession owes its great strides in surgery to the progress of anæsthesia, the discovery of which was made by members of the dental profession,—a fact of which every dental surgeon should be proud.

Much has been written in the last few years on general anæsthesia in surgical work, and we find in the text-books as revised from time to time, that a great deal is added which is really new, but also more is retained by the different generations of writers, which is accepted as it was first written, without further investigation.

For instance, we find that a great many anæsthetists and surgeons believe that chloroform should be given in preference to ether in all pathological conditions of the kidney and lung. This belief is based on the experience and assertion of the earlier writers on

anæsthesia, and I have no doubt that they were correct at the time of their writing. But since that time great advance has been made in obtaining a chemically pure drug, and particularly in the method and skill of administration, so that, now I believe ether is much safer in these pathological conditions than chloroform, owing to the immediate and the delayed toxic effects that the latter drug has on the vital tissues of the body.

In these few short notes on general anæsthesia, I would like to say something that would be of immediate practical value in a general dental practice.

With regard to the patient, the general surgeon has this great advantage over the dental surgeon, in the greater ease with which the former's patient takes the anæsthetic, due to a great extent to the previous preparation of the patient.

Apart from emergency work, the patient of the general surgeon has had his alimentary canal thoroughly cleansed by purgatives, the diet has been regulated, so that only light diet has been taken for at least twelve hours previously, and within four or five hours of the administration nothing has been eaten. Besides this, he has had all his clothing removed, and, with only a light covering, has been placed in a comfortable recumbent position.

On the other hand, a patient comes to the dentist's office without any preparation, perhaps with a full stomach and a loaded bowel, encased in clothing which more or less constricts the neck and chest, and is thus placed in a chair, where the anæsthetist has less control over the patient than if he were on a table.

This usual condition of a patient about to have an anæsthetic in a dentist's chair, might be corrected when it is possible to instruct him beforehand. He should be told to take a purgative which will act promptly and efficiently about twelve hours before the administration; subsequently to eat of light, easily digested food, and when coming to the office, to wear clothing as loose as possible.

When such an anæsthetic as ether has to be given, or when chloroform, either wholly or in part, is the choice of the physician, the dental surgeon would be wise to arrange to go to the patient's house to perform the operation, and in the majority of cases this can be arranged. It relieves the dental surgeon of the extreme responsibility of the after-condition of the patient. Otherwise it may be hours after the administration of such powerful drugs, owing to sickness and nausea, before it would be possible to remove the patient from the office. Then there are the mental effects produced on other patients who may happen into the office, to be considered.

Besides this removal of responsibility, a greater factor is the safety of the patient, which is made more certain in having these more powerful anæsthetics administered in the patient's home, under conditions somewhat similar to those required for a surgical operation, and in all cases of debility it would be wise to insist on this procedure.

When nitrous oxide, ethyl chloride, or nitrous oxide and oxygen are given, these preparations and precautions may be modified, but certainly not dispensed with.

In many cases the dental surgeon has to administer these gases himself before performing the operation. This is no easy task, considering this lack of preparation just mentioned, of the patients on whom he may be obliged to operate.

The dentist should see to it, however, that the patient, having removed as much of his outer clothing as may be necessary, and loosened up collars, corsets or waistbands, that he be placed in the most comfortable position, having regard at the same time to that in which the operation can be performed the most expeditiously.

To a dental surgeon in such a position the following rules should be kept in mind:—

While administering the anæsthetic, if the patient shows signs of distress or of taking the anæsthetic badly, immediately let him have sufficient air to relieve the untoward symptoms. Proceed again a little more cautiously, admitting more air as the patient becomes unconscious.

Do not be in too much haste to get the patient under, and when he has attained the required degree of surgical anæsthesia, keep him in this degree for a time, relative to the length of time required to do the operation, for the longer a patient is kept in the surgical degree of anæsthesia the later will be the return to consciousness when the anæsthetic is withdrawn, thus giving more time to do the work. This rule applies to all general inhalation anæsthetics.

Never continue the operation after a patient is returning to consciousness, where nitrous oxide or ethyl chloride in some form has been used. For it is this fact that discredits these more evanescent anæsthetics.

The patient feels pain perhaps from the last tooth being extracted, and declares that he felt the whole operation; or he may take it as the beginning of the operation, and so become terrified, in this sub-conscious condition, thinking that he has still to go through the whole operation. In this case it is better to give more of the anæsthetic.

When a physician gives the anæsthetic his choice may be, and particularly in the country, often is chloroform. Then it is the moral duty of the dentists to keep a close watch on the condition of the patient, as to color and respiration, and if anything alarming is noticed, to quietly draw the anæsthetist's attention to it, for it is probable that the dentist has seen many more anæsthetics given under these conditions than the administrator.

On the other hand, it is to the mutual benefit and advantage of both the patient and the anæsthetist, if the dentist refrains from touching the patient, or from making any remark whatever, these acts worry the patient, and distract or disturb the attention of the anæsthetist. It is always well, however, to stand nearby, and be ready to lend assistance should the patient show excitement or struggling.

If the patient stops breathing during administration from whatever cause the face piece should be immediately removed, the head lowered if possible, and the tongue drawn forward, while artificial respiration is begun.

If during the operation, breathing is disturbed by the inhalation of blood, or a piece of tooth, the patient should be inverted.

THE NEW YEAR.

WITH all sincerity "Oral Health" extends to its many readers a most happy and prosperous New Year. One of our good friends passed along to the editor what he was pleased to call a few "New Year Jolts." The load is herewith shifted to other shoulders.

JOLT No. 1.

You may have been born inquisitive, but for heaven's sake keep it dark.

JOLT No 2.

The beauty about a thirst for knowledge is that there is no "morning after."

JOLT No 3.

Cheer up ! ! !

What if you do backslide. You can pick out the splinters and sell them for tooth-picks.

GUM CHEWING— PROS AND CONS.

WE publish below extracts from two articles referring to gum chewing, in which the opinions expressed are very much opposed. The first is from an article on "The Therapeutic Action of Chewing Gum," by J. P. Corley, M.D., D.D.S., Sewanee, Tenn., appearing in the *Dental Dispensary Record*, and the second from a lecture on "Dental Hygiene," by Mark G. McElhinney, D.D.S., Ottawa, appearing in *Dental Practice*.

The manufacturers of chewing gum all make the claim that its use is beneficial to the teeth. Leaving aside the fact that gum chewing in public is commonly looked upon as vulgar, the question is one in which the dental profession is interested, if for no other reason, from the fact that the claim that its use "prevents decay" decorates every bill-board in the country. The two extracts, read together, form a most interesting comment on the subject.

"As a means of obtaining speedy and partial relief for some of the ills of maxillary inactivity, I commend the employment of chewing gum. Twenty-five millions of dollars worth is sold per annum in the United States, and I am convinced that its wide popularity is nature's protest against maxillary inactivity. I have used it in my practice for some years, and find that if employed in early life it materially augments the development of the muscles of mastication, maxillary bones, alveolar process and salivary glands. Incidentally it perfects occlusion, increases the dimensions of the entire face and conduces to the symmetry of its skeleton. It also encourages wholesome and hearty mastication.

Locally it cleanses the teeth and massages the gum. There is no accretion except calculus, which it will not remove. It readily packs into cavities and sulci, taking up all decomposable matter. It will often discover approximal cavities. The discomfort which it causes in these places and by its pressure on unprotected gingivae will send its user to the dentist for relief. I have never seen a confirmed gum chewer with unfilled cavities, an unclean mouth, or a tendency to pyorrhea. When instruction, persuasion, admonition and ridicule fails to produce a clean mouth put your patient on chewing gum. A good gum will not adhere to a normal tooth surface; but it puts a royal premium on occlusion and approximal contact, and the patient who is afflicted in this respect and has un-

polished or overhanging fillings will make his dentist's life a burden until the fault is corrected. I know of no possible harm from the use of a good chewing gum. It is possible, but not probable, that there are gums on the market which contain chemical ingredients which, under certain conditions, would disintegrate enamel. But if this is true the buccal action incident to chewing the gum would wash it out before harm could be done. On the other hand candies, aside from their adulteration are usually taken with little buccal-activity and a residue remains in actual contact with the teeth, until dissolved, undergoing fermentation meanwhile. Dr. J. Y. Crawford, a man quick to read the handwriting of nature and assiduous in the study of pathological phenomena and altogether a pioneer in modern dentistry, maintained that 'The candy shops of America have been a greater curse to humanity than the whisky shops.' While this is a bold and debatable position, it is extremely significant coming as it does from a man whose office was an observatory. It is easy to substitute gum for candy and the various knickknacks of which children are so fond and with which they are usually surfeited. Much of the massage recommended by Dr. D. D. Smith and others can be accomplished by the use of chewing gum and often without interfering with other duties. For typhoid fever and other convalescents it will restore the white decalcifying enamel. Hygiene may be summed up in two words, 'Exercise and Cleanliness,' and in this day of ultra-fastidious cooking, chewing gum is the oral custodian's ally. If we can create a demand for a strictly dentifrice gum with sufficient resisting quality and without aromatic flavoring, and at a reasonable price, the manufacturers will be quick to put it on the market. I think they will even do their share in its introduction. Such a dentifrice if introduced in our juvenile practice would extend its influence far beyond that of mere sanitation and would establish a legacy to future generations."

* * * * *

"There are some habits to which children, and sometimes older persons, are prone, and which should be discouraged.

"First amongst these stands the chewing of gum. Despite the alluring and misleading advertisements of the gum manufacturers, this habit is responsible for much evil.

"In the first place, from an esthetic standpoint, because the continued action of the jaws over-develops the lower part of the face, thereby lowering the tone of the expression. No little girl who indulges in this habit can expect to grow into a really beautiful woman, and the same principle applies with equal force to the boys.

“In the next place, the continual action of the jaws uses up certain amount of nerve force which is, in this instance, altogether lost, since the chewing of gum serves no useful purpose.

“A gum-chewing child suffers from a continual distraction of the mind; the blood is thrown into the muscles of the jaws instead of into the brain, and study is rendered more difficult. Gum-chewing is really a nervous habit, and all nervous habits are a drain on the nervous system. Children should be taught to control their muscles when motion is unnecessary. Such acts as making faces, twiddling the fingers, tapping with the feet, biting the nails, squinting, gnawing a pencil, or chewing gum, may result in stubborn nervous habits, which lead to great unhappiness in later life through self-consciousness and the inability to go into company without being unpleasantly conspicuous.

“The last and perhaps most serious result of gum-chewing is the irritation of the glands of the mouth, thereby causing a continual flow of saliva. Saliva is absolutely necessary to digestion and should not be wasted. Between meals, only sufficient should be secreted to keep the mouth moist. If the glands are continually made to secrete saliva, they lose their power of control, and such a condition is called catarrh.

“If saliva is swallowed in excess, between meals, when it is not needed, it causes a useless flow of gastric juice, and if this is persisted in, the glands of the stomach also lose their power of control, and catarrh of the stomach, a most unpleasant and serious disease, may result.

“The direct effect of gum-chewing on the teeth is useless wear of the enamel and a tendency for the teeth to become unduly sensitive. The indirect effect is acidity of the secretions due to indigestion, with increased sensitivity and liability to decay.”

HABIT REIGNS.

An old librarian, unable to find his umbrella one evening, returned and looked anxiously for it in the card index under the letter “U.”

The sociable man is one who, having nothing to do, comes around and bothers one who has.

A FEW POINTS ABOUT PULMONARY TUBERCULOSIS.

Specially written for "Oral Health," by

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Gravenhurst, Ont.*

JEDER MANN ist am ende bische tuberkulöse," but while we are probably all infected by tubercule bacilli at some time, fortunately, we do not all develop clinical tuberculosis. Hamburger found evidences of tuberculous infection in 77 per cent. of all children between 11 and 14 years of age coming to the postmortem table, while Nägeli found evidences of tuberculosis infection in 97 per cent. of the bodies of adults. It is thus quite probable that we are all infected before we grow up.

The death rate in Canada is about 13,500 yearly, in Ontario about 3,000; that is, twenty deaths from tuberculosis annually in every 10,000 people. In some centres this enormous death rate has been reduced, largely as a result of the active crusade against the disease. The annual death rate from pulmonary tuberculosis in London from 1887 to 1906 was reduced from 20 per 10,000 to 14 per 10,000. In Edinburgh during the same period the rate was reduced from 20 to 11. This much is encouraging, and when we recall that, though everybody is infected, 80 per cent. of all deaths are from other causes than tuberculosis, we see the best proof of the curability of the disease.

When we know the prevalence of phthisis and its frequent curability let us review the essentials of early recognition, of prophylaxis and of treatment, dwelling upon the value of sanatorium regime. These points should be known to the men who are leaders and teachers of public opinion, more especially should they be familiar to the professional classes who are waging the battle of health,—namely, medical men and dental surgeons.

In the early diagnosis of chronic pulmonary phthisis we meet with two chief difficulties, viz., the insidiousness of the onset and the popular prejudice against "Consumption." Unless one is educated to recognize the possibility of this infection in any one or two



THE MUSKOKA FREE HOSPITAL FOR CONSUMPTIVES

(Winter Scene, showing the large buildings)

of a certain group of symptoms one usually takes no notice of them until these symptoms are so marked that the disease is well advanced. The histories of our cases show, indeed very often, that one or two "rather indefinite" symptoms have been present for months and even years before the patient has sought the advice of a physician. These symptoms, in order of frequency, are cough, languor, anorexia, hæmoptysis (including streaks or specks of blood in the phlegm), expectoration, rapid pulse, emaciation, loss of weight, pallor, slight fever and night sweats. No one symptom is necessarily present in tuberculosis. For instance, taking the two most frequent symptoms, cough and languor, these may both be absent in tubercular individuals. With such indefinite or easily overlooked symptoms as a hacking cough, a little expectoration in the mornings, and perhaps frequent fatigue, a man may go from month to month, stubbornly determined not to give in to what he may consider some slight bronchial trouble or digestive disturbance, and at the same time become progressively worse in tuberculosis.

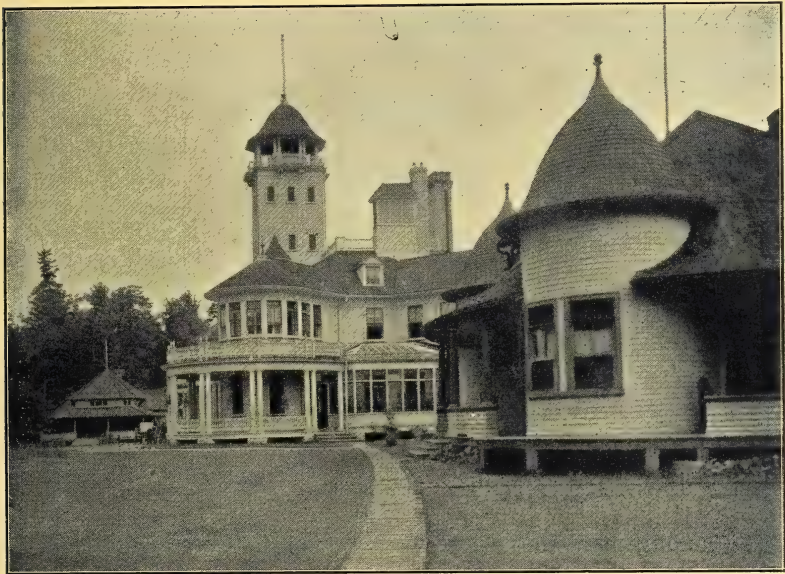
Alongside of this most treacherous, serpent-like mode of approach, we may place the other great difficulty in getting the disease early, that is, the popular prejudice against anything bearing

a "tubercular" name. To bring out the chief points of this prejudice I will state an argument why a physician cannot always inform his patient immediately of the diagnosis. If the physician were at once to tell his patient that he had tuberculosis he would not infrequently be conveying to that patient three most unpleasant (to say the least) impressions that were not strictly true. The patient, unless he had previously learned a great deal more about tuberculosis than most folk know now, would believe that he had a loathsome, most contagious and fatal disease, whereas, with a little education such as we give in Sanatoria, the disease is neither loathsome nor contagious, and under special medical care it is far from being always fatal. The majority of our patients in Muskoka appear healthier than do folk in the city. "The classic description of the consumptive, read alongside of patients under treatment on ærotherapeutic lines, sounds exaggerated and false." Figures based upon our weekly weight night, November, 12, 1909, will indicate this:

75 patients, average weight	135 $\frac{5}{8}$ lbs.
43 men, average weight	142 $\frac{1}{2}$ lbs.
32 women, average weight	126 $\frac{3}{4}$ lbs.

One would not expect such patients to look ghastly. Our visitors are always impressed with the great cleanliness of the hospital and grounds and the neat and clean appearance of our patients. Statistics prove also that we are living in a place safer than most others, a sanatorium being probably the only place where the necessary restrictions are enforced. The only source of infection, the sputum, with its tubercle bacilli, is cared for and burned. As to the curability, I referred to the best proof in my introduction, and we can show numerous charts of ex-patients who had tuberculosis. I cannot do better than to quote R. W. Phillip, M.D., before the Sixth International Congress on Tuberculosis, held at Washington, in 1908.

"Tuberculosis permeates human society as does no other malady. It is one of the tolls levied on mankind because of his social habits, and society suffers through its ravages no less than the individual. It is the expression of an incomplete civilization. The social faults, of which it is the register, are, especially, deficient aeration and overcrowding. The recognition of this fact is evidenced in the measures which Science and clinical experience combine to enjoin in the treatment of patients. Under conditions of hyperæration, the consumptive patient, even if gravely ill, frequently recovers. Yet how difficult it seems to attain for PROPHYLAXIS what we strain every effort to follow as a therapeutic procedure!" Dr. Phillip refers here to the great difficulty in getting people to sleep and live in fresh air. Some, I am glad to note,



THE MUSKOKA COTTAGE SANATORIUM

(Showing one main building with tower and two cottages)

appear to be adopting more rational sleeping quarters than closed up rooms. I believe not a few sleeping porches have been built and are in use in the City of Toronto during the last few years. Referring just here to the care with which the former generation used to warn us against the night air—this same night air in our cities is indeed usually more pure than the day air.

In general prophylaxis for tuberculosis consists in keeping up the general health, taking required rest and good food, avoiding worrying factors and protecting the body from infections of all kinds. Last month's "Dominion Dental Journal" and "Oral Health" both referred to a most interesting meeting of the "Section of State Medicine" of the Toronto Academy of Medicine, held Oct. 27th last. The papers of the evening were a symposium of Dentistry bearing on the importance of oral and dental conditions in the health of the individual. I may state her that it is much more than the last straw which broke the camel's back, when, after finding so many of our cases advanced in pulmonary phthisis and perhaps with complications in the bowel or throat, to also find a poor or bad set of teeth, carious and decaying roots, or frequently pyorrhæa alveolaris. In some older institutions than ours, I under-

stand, the authorities will not proceed with medical routine treatment until the mouth is first made clean and the teeth set up.

Our visiting throat specialists, in particular our late respected Dr. Charles Stewart, have frequently urged our patients to consult dentists for the teeth. Our physician-in-chief, Dr. W. B. Kendall, and myself had correspondence with the "Ontario Dental Educational Committee" last year on the advisability of having a dentist appointed to the medical staff. The report of the committee who saw Mr. W. J. Gage, our executive chairman, in regard to the matter was in last month's "Dominion Dental Journal." It recorded Mr. Gage's promise that this question of dental treatment would receive one of the first considerations in the expected rearrangement of the finances of the institution.

Before leaving the subject of prophylaxis, let me refer to the protective measures as inculcated into the minds of the patients taking a course at a sanatorium. In precept and practice the physicians and nurses explain and demonstrate how, by taking certain precautions with the infecting media—the expectoration—tubercular patients no longer endanger the health of others. These points among many others are well brought out in Knopf's little book, "Tuberculosis, a Preventable and Curable Disease." This book should surely be in the library of every philanthropist and every professional man.

The treatment of "phthisis pulmonalis" resolves into the three main factors: Rest, Hypernutrition and Hyperæration. Rest here implies much more than is generally inferred by this word. Dr. Kendall has said that the longer he studies the disease the greater value he sees in this one factor. In his lecture on "Rest" he repeatedly reminds us of its double meaning, rest of mind as well as rest of body. Throughout his whole scheme of supervision can be recognized the effort to make and keep the patient comfortable and care-free, to encourage and reassure, and to guide the patient day by day and week by week through the prolonged process of improvement, arrest and cure of the disease.

It takes months and often years to effect this arrest or cure, and we have unbounded faith in the part played by special institutions such as ours in the proper regulation of rest and exercise, fresh air and efficient diet, hygienic education and medical treatment. For there is no specific cure for tuberculosis, and the process of treatment requires the constant and patient supervision of every detail of a patient's life. The physician must have the patient's entire confidence and should, we believe, have certain natural qualifications, as well as special training. Francine, in his handbook, "Pulmonary Tuberculosis," lays great stress on these

latter points.

I have not referred in this paper directly to the etiology, nor have I dealt with the subject in the usual routine fashion of a popular lecture. I have endeavored to cover the outstanding features of a large subject in as terse and as practical a manner as is possible, and at the same time to retain the interest throughout the rehearsal of many ordinary details.

WANTED—COPIES OF “ORAL HEALTH.”

A NUMBER of practitioners have made requests to “Oral Health” for missing copies of the magazine, required for the completion of the 1911 volume.

Copies have been forwarded by us as far as our supply lasted, but further copies are required for the following months:—

February.

March

April

May

June

July

November

Members of the profession who are not having last year's magazine bound and have these copies on hand will confer a favor by communicating with the editor.

The effectiveness of oral hygiene and the attitude of the profession toward it will be simply the reflection of the conviction and practice of the individual members of the profession. Each must foster a lively sense of the responsibility resting upon him.

THE RELATIONSHIP OF DECAYED TEETH TO ADENOIDS AND ENLARGED TONSILS.

IN the annual report of the Board of Education of London, England, a report is included showing the relationship between the presence of carious teeth and that of enlarged tonsils and adenoids. The object of the investigation was to see if statistics bear out the statement that enlarged tonsils and adenoid growths are often due to infection of these tissues with bacteria and toxins from decayed and abscessed teeth. The report states that "there is a definite increase in the percentage of children suffering from each of these conditions tabulated amongst those whose dental condition is unsatisfactory."

No one who has had an opportunity of seeing the mass of infection and uncleanness in a great many children's mouths will question the proof so clearly demonstrated in the above table. In examinations of school children's mouths the attention is soon drawn to the frequency with which unhealthy mouth conditions are accompanied by a throat blocked by tonsils and adenoid growths.

	500 Aged 7—8			500 Aged 13—14		
	95 Sound Teeth	277 4 or less Carious	128 more than 4 Carious	154 Sound Teeth	318 4 or less Carious	28 more than 4 Carious
Enlarged Tonsils present ..	21.1	22.0	32.8	13.6	18.2	28.6
Do. recently removed	23.2	25.3	34.3	17.5	22.0	35.7
Adenoids present ..	12.6	12.3	17.2	3.9	9.4	14.3
Do. recently removed	16.8	17.0	21.1	5.8	13.5	21.4
Cervical Glands enlarged ..	16.8	21.0	19.5	5.8	10.7	10.7
Submaxillary Glands enlarged ..	13.7	20.6	20.3	3.2	11.6	25.0

DENTAL ECONOMICS.

BY N. S. COYNE, D.D.S.

MUCH is being written, and much is being said in this present age in regard to the raising of the status of Dentistry. I wonder how many practising dentists ever asked themselves why dentistry as a profession had not, in years gone by, been looked on as the noble profession that it is or shall be. To my mind there are two main reasons why Dentistry has not been held in as high esteem by the public as its members have desired. They are these: incompetent service, and Jack-knife-carpenter's fees.

Many men will no doubt resent the first reason I have advanced, but that will not change my opinion in the least. In spite of any amount of protests the fact remains that the average dentist does not give *nearly* as good service as the public are in need of, as it is possible to give, or as is expected of dentists. Not that the Academic training is at fault, not that our course is too short; but rather because we do not give the best, or nearly the best, services that this skill and ability will admit. I don't mean the country dentist alone—not by any means—but the average dentist in city or town.

The question that now arises naturally is, Why is such the case? The answer is simple. The average dentist can't afford to expend the time to execute his operations properly, or nearly so, at the fee "generally charged" in his community—rural or urbane. But some men argue this way, "A filling is a filling, they all look alike to the public; they don't appreciate an extra effort." Such an argument as this by no means justifies a man in rendering poor service. When a man obtains a license to practice dentistry he is supposed to give as good service as his skill and ability allows, not as good service as the public will appreciate. But, to go beyond this, the day for saying "A filling is a filling" is, or should be, past and gone. Fillings can no longer be doled out as boots or hats at so much per.

Again, a dentist never wants to run away with the idea that the patient doesn't see and realize when the operator is painstaking and thorough. Patients will, in fact, remark to the dentist, "My! you're awfully particular," or, "You're certainly thorough in

your work," or, "You must have a lot of patience or you couldn't spend so much time on one tooth," or some similar remark.

But so many men say, "We could never save a cent if we were to spend so much time on detail." I'll admit we couldn't at 50 cents or 75 cents or \$1 a filling. There's an old family saying, "A thing that's worth doing is worth doing well." This is particularly true of operations in the oral cavity. Worth doing well—from the dentist's viewpoint—and worth doing well, decidedly worth doing well, from the patient's viewpoint. If its worth doing well from the patient's viewpoint, its worth paying well for. It seems to me this is the only logical, practical conclusion to come to.

But many practitioners persist in saying, "It takes a long time to educate the public." Supposing it should—to my mind that's what we're here for. While we're educating the public we can be collecting a proper fee for the service we render—so that the dentist is benefited as well as the patient. My argument is simply this. "Be thorough, both in the execution of all operations, and in assessing the fee." Why should we be any more slipshod in the latter than in the former? If a patient presents, requiring the incisal corner of a central restored, be thorough—restore the corner to its proper anatomical shape, although it should take three or four times as long and "a bit more gold" than would be necessary in "dubbing off" the corner in order to be able to do it for \$2. If it's necessary to charge \$8 or \$10 charge it. The patient has received much better value in this latter way than he would at \$2 or \$3, and the work only half done. If a case presents with a decayed molar, dentine deeply stained, even approaching the pulp so that protection is necessary; be thorough although it may be necessary to cut and chisel and excavate long and carefully; yes, even if it should be necessary to spend an hour or an hour and a half to prepare and fill with amalgam. Don't back up—prosecute your operation with the same thoroughness that you were compelled to in the college infirmary. There's no "short cut" that I know of—only one way; that's the right way, and, when done, don't get behind the patient and bite your nail and wonder if you dare charge more than 75 cents. Don't choke back a sigh and work your pulse up to 200 for fear your patient will leave for *good*—never come back—go to Dr-Do-it-Cheaper if you dare charge \$1. Charge what its worth. If you don't know what its worth take half a day off and figure it out; and, by the way, if you have spent an hour and a half and charge less than \$3, you're going to be a subject of Charity when you're sixty if you don't die of starvation long before.

But, again, another argument put forth is this: "It's all right for men in the city to do good work and charge for it, but people in

the country aren't built that way—its just the 'city folk' that one can work that system on." And the dentist in the city says, "The other fellow round the corner extracts teeth and does 'plate work,' I've got to do it or I won't get the patronage. We've all got to do the same."

This kind of talk is all bosh. In the first place the country people are entitled to first-class dental service as well as city folk are, and country people generally want it. By this I mean thorough, skilful, honest work. Why should country people want their teeth "plugged" with "silver" while city people have their's properly treated and properly restored to their natural functional power? On the other hand, why should the city practitioner render incompetent, inferior service at a cheap fee simply because the fellow round the corner does the same. The patient has presented herself to *you*—not to the fellow around the corner. She evidently wants your service, and it's up to you to give that patient such service as will give her a desire to employ you in the future, and not look elsewhere for a dentist. The fee won't drive the patient to some other fellow if the services rendered have been honest and competent; but inferior service *will* drive the patient to some other dentist, no matter how low or beggarly your fee may have been. I believe the dentists' motto should always be: "Good Services and Good Fees."

A few weeks ago a deputation from the Dominion Cannery waited on our Town Council in regard to a canning factory proposition for our town. In the course of the interview, I was struck with a remark from one of the deputation (the President of the company) as to their aim. He said: "Gentlemen, our aim is cleanliness and quality. We require an abundance of water for cleanliness, and we require your best natural products, in order that we may produce the quality." Now, surely, if the aim of a company preparing food for the human race is cleanliness and quality, is it not as necessary that the aims of the dentist, who treats the organs that are given us to masticate that food with should be as high as that of the manufacturer? Is it not reasonable to say that the aim of every dentist should be "cleanliness" and "quality"?

But I would just like to mention that while the aim of the Dominion Cannery is as I have stated, I note with equal interest that the same company operate their entire concern on a money-making basis. The Dominion Cannery sell their goods for a good price, made possible by first producing the quality. This may seem to some like rather a crude comparison, and even unethical, but I believe if more dentists looked at the practice of dentistry through their glasses there would be fewer unethical dentists.

THE DENTAL SURGEON IN THE ARMY.

GREAT BRITAIN.

DENTAL REQUIREMENTS FOR BRITISH NAVY RECRUITS.

The condition of a candidate's teeth is a most important point, and very great care should be exercised in examining them.

Five teeth defective or deficient in candidates for entry as Boy, 2nd class, and seven teeth defective or deficient in other persons under 17 year of age on the day of entry, ten defective or deficient teeth in persons above the age of 17, provided none of them can be rendered serviceable by dental repair, are to be considered generally as disqualifying a candidate; but both classes of persons should possess some sound opposing molars and incisors on both sides.

The numbers of defective teeth given above are intended as a general guide, but the rule is not to be too rigidly adhered to if the remaining teeth are in good condition, or can be made so, and are likely to remain serviceable for at least twelve years.

Credit is to be given for teeth which have not erupted.

DENTAL REQUIREMENT FOR BRITISH ARMY RECRUITS.

That the recruit possesses a sufficient number of sound teeth for efficient mastication.

The acceptance or rejection of a recruit on account of loss or decay of several teeth will depend upon the consideration of the relative position of the sound teeth; thus the loss of several teeth contiguous to each other may be a cause for rejection, but not the loss of a similar number if those remaining are so distributed as to permit of efficient mastication. Again, the loss of many teeth in a man of an indifferent constitution would point to rejection, while a thoroughly robust recruit who has lost an equal number might be accepted.

UNITED STATES.

The following communication will be of interest to those who are endeavoring to raise the status of the dental surgeon in the militia forces of Canada:—

THE STATE MILITIA DENTAL CORPS,

Washington, D.C., October 6, 1911.

To the Dental Profession.

The following is a copy of the decision of the Chief Division of Militia Affairs, War Department, Washington, D.C., regarding the establishment of a Dental Corps in the Organized Militia of the United States, for the information of the dental profession:

BULLETIN OF MILITIA NOTES, ISSUED BY THE DIVISION
OF MILITIA AFFAIRS, WAR DEPARTMENT.

FOR THE QUARTER ENDING DECEMBER 31, 1911.

November 1, 1911.

Section 3 of the Militia Law requires the Organized Militia to conform to the organization, armament and discipline of the Regular Army. The Act of March 3, 1911, authorizes a Dental Corps to be attached to the Medical Department, prescribing certain limitations as to numbers of this corps. The Dental Corps is a part of the Regular Establishment, and in the opinion of this office, the Organized Militia would be authorized to attach to its Medical Department a Dental Corps in conformity with the proportion prescribed by the Act of March 3, 1911, and the officers of such corps, when on duty, would be entitled to pay out of the Federal funds allotted to the State.

R. K. EVANS,

Brigadier-General, Chief Division of Militia Affairs.

It is the opinion of that office, that under the Act of March 3, 1911, the members of the State Militia Dental Corps whenever established, shall be at once commissioned as First Lieutenants in that organization. That the contract feature of the Act of March 3, 1911, does not apply to militia organizations.

That the question of the contract service should not be raised by members of the dental profession who may desire to become members of the State Militia Dental Corps of any of the United States.

That they should assume it to be their right to be commissioned as First Lieutenants of the Dental Corps.

Therefore, I beg of those members of the dental profession who may desire to become members of the State Militia Dental Corps and attached to its Medical Department, under no circumstances to either refer to said contract service as is contained in the law governing the regular army, or to accept any position other than a commissioned first lieutenant, if referred to by any authority of the State or militia organization. It is absolutely necessary for the welfare of the dental profession throughout the country, its progress and standing, that its members conform to this condition.

Should the question be raised by other than dentists, then will be time to demand an official ruling of the Judge-Advocate General of the Army for final settlement of the question. In my opinion, based upon conditions applying to other officers in the Militia Organizations of the United States, the question of contract service will not be raised; but to prepare the members to confront the situation should it arise, I have written this warning.

Remember that what applies to one State must apply to all in its organization of militia and be governed accordingly that the best interests of the dental profession may be guarded and its social standing upheld by the members thereof.

Respectfully submitted,

EMORY A. BRYANT.

THE CONSTRUCTION OF GOOD VULCANITE DENTURES.

BY J. H. PROTHERO, D.D.S., CHICAGO.

IT is a deplorable fact that very few dentures are constructed so as to grind and reduce food substances with anything like the same thoroughness that is possible with the normal human masticatory apparatus. The average denture of to-day is capable of occasionally puncturing morsels of food, but is practically useless as far as grinding is concerned. This is due to the fact that only occlusal conditions are considered and worked out, usually very imperfectly at that, for few attempt to modify the occlusal forms of artificial teeth and fewer still to modify the cusp forms so as to permit the anatomical movements to be performed.

The force required to crush food between teeth with well developed occlusal surfaces when the hinge motion is made use of is much greater than if the lateral movement is employed.

A comparison of the results of grinding versus crushing force is found in Dr. Head's article in the *Dental Cosmos*, December, 1906. Here he makes use of the findings of Dr. Black's phagodynamometer as furnishing a fair test of the force required to crush food by direct thrust and compares these results with experiments conducted with a human masticatory apparatus in which the food was subjected to the grinding motion.

The following is the table referred to:

Meats.	Head.	Black.
Corned Beef	18-22	30-35
Tongue	1-2	3-5
Tenderloin of beef, very tender	8-9	35-40
Round of beefsteak, tough	38-42	60-80
Roast beef	20-35	35-50
Boiled ham	10-14	40-60
Pork chop	25-30	20-25
Roast Veal	16	35-40
Average	17-20	32 $\frac{1}{4}$ -41 $\frac{1}{8}$
Vegetables.		
Raw cabbage	16	40-60
Head lettuce	8	25-30
Radish, whole brake at	20-25	20-25
Radish, pieces pulverized at	10-15	35-40
Average	12 $\frac{1}{2}$ -16	30-38 $\frac{3}{4}$

Is any further argument necessary to convince the prosthetist that the greatest usefulness with the least expenditure of force is developed in teeth occluded anatomically. If so as an additional argument let it be borne in mind that anatomically arranged teeth balance. In other words there is no idle side, for while food is being reduced and ground on one side the dentures on the opposite side are supporting each other in smooth gliding contact. System in that, isn't there. Might as well expect an eight-wheel ordinary locomotive to run on a mono-rail and maintain its equilibrium as that unbalanced dentures will remain seated under active lateral masticatory effort.

A contributory as well as a frequent primal cause of poor adaptation lies with the impression. Unless the impression is manipulated skillfully and removed from the model immediately on the setting of the plaster a warped as well as an expanded model results. The change is slight, it is true, and a careless prosthetist might not discover any fault of adaptation in a denture produced from such model because the careless prosthetist never has a case of excellent adaptation.

I say this without fear of contradiction for adaptation in favorable cases without effort better could be secured if striven for. Experience has led me to discard plaster of Paris for impression work whenever possible.

Three classes of cases present, however, where this material is positively indicated: First, where any of the natural teeth are present. Second, where there are undercut surfaces opposed to each other. Third, where the ridge is flabby and will be readily distorted or bent out of shape. In all other cases a modelling compound that becomes plastic at very low temperature and hardens quickly can be used to best advantage. Two such compounds are on the market to my knowledge. Stent's Compound, made by Ash & Sons, and Perfection Compound, made in Detroit. But little expansive or contractile change is noticeable in either of these varieties and what little may occur is eliminated by subsequent procedures not possible to employ with plaster.

Method of manipulation for upper impressions is as follows: Select a tray of appropriate size, but long enough to cover all of the hard palate if possible. Place compound and introduce in mouth pressing well up to position. Conform the labial and buccal surfaces of border by external pressure. In most cases pass the middle fingers of both hands back in central palatine vault and lift the compound in this location up against the soft palate, holding the material in position until fairly well hardened (the tray being held with the index fingers). Remove and chill. The impression

will come away easily, as the adaptation is not yet developed. Trim off excessive surplus, round away the angles resulting from the cutting and remove all chip debris.

Now invert over a small gas or alcohol flame and soften the impressed surfaces to the depth of 1 to $1\frac{1}{2}$ mm. and quickly return to the mouth. The chair should be tipped back so that the operator can stand directly behind the patient and when the impression is again seated a firm steady pressure of from 15 to 30 pounds is maintained upon the tray for three or four minutes to bring about a readjustment of the softened film of compound. Under the pressure the compound moves from the hard to the softer areas, in fact it is crowded onto and compresses them.

On removal the impression is again chilled and reheated if necessary and the process repeated. Patients frequently complain bitterly of the discomfort experienced in removal of the impression which in some few cases observed, owing to the almost complete exclusion of air from between the contact surfaces indicated that nearly a perfect vacuum had been produced. Lower impressions are treated in a similar manner, but on account of the decreased area involved, less effort will be required for dislodgment than in upper cases.

Upper impressions should be relieved in the central palatine portion to a slight extent, say $\frac{1}{2}$ mm. for even with the compression, of soft tissues carried out in the impression, under use the denture is inclined in time to settle and rock.

In lower cases the deepest part of the impression or that portion which reproduces the crest of the ridge is sometimes slightly scraped from about the region of the second molar to the corresponding tooth on the opposite side. By so treating these cases the crest of the border is not impinged on when the lower denture is under load and in addition this treatment permits the peripheral margins of the denture to settle firmly into and against the soft tissues, thereby excluding the air. In many cases a partial vacuum is developed which materially adds to the stability.

A few words on models will be applicable at this time. All plasters, good, bad and indifferent, expand in setting, some more, others less, all variable, depending on conditions and how manipulated. Moderately coarse plaster, medium setting as to time, good hardness when set is preferable to the finely ground quick setting varieties for model work because of less expansion.

A moderately thick mix should be made, the mass stirred slightly and introduced into the impression as quickly as possible. As soon as hard enough to handle, remove the tray and impression to prevent warpage.

Trim the labial and buccal surfaces somewhat inside of peripheral outline with a discoid instrument to a very slight depth to compensate for general expansion. This trimming raises an imperceptible bead on these surfaces, and if properly located will not be obliterated by subsequent peripheral trimming frequently necessary to relieve irritation. A plane should be scraped across the distal part of the model, usually about one-eighth inch wide and meeting the buccal beads at the tuberosities. This area should be tapered from nothing anteriorly to $\frac{1}{2}$ mm. in depth at the distal margin and forms at this point the line or distal termination for the denture.

The beading on the sides of the model compensates for general expansion of the plaster, the line across the distal insures the base plate being imbedded in the tissues and guards against the ingress of air in this most vulnerable area.

The construction of base plates on which to build rims of wax for determining facial contour, length of teeth and for bite purposes, locating the condyle ends, taking the bite, use of the face bow, and mounting the models on the frame have been well described in previously published articles, and it is not necessary to take up your time by such repetition. Clinics will be given to make the various steps clear when at the same time the registering of the condyle path will be explained.

The next important step in logical order will be the preliminary grinding of the teeth selected for a given case. It will be found a most convenient and time-saving method to modify the occlusal surfaces of all the bicuspid and molars even in the best forms of teeth now supplied us by the manufacturers if the greatest efficiency is desired.

A moderately fine grit corundum stone $\frac{3}{8}$ of an inch face, 3 inches in diameter, is a convenient size to use. An emery turning device should be applied to each angle and two faces developed which meet in the centre of an angle of about 120 degrees.

The central groove of each tooth is applied to this angle, while the two surfaces cutting buccally and lingually knock off the high points and develop somewhat flattened planes where only marble-like surfaces existed. Teeth properly treated in this manner will still retain most of their characteristic surface markings and when occluded will fit together and work like millstones.

In full cases the upper teeth are arranged first, the wax rim indicating their correct position. The second bicuspid on one side is the first in the lower arch to be placed, because by beginning with a tooth the varying occlusal planes of which are received by corresponding opposing planes the broadest contact areas will be utilized.

The placing of the tooth in correct occlusal position, however, does not prove its correctness under action, and it should be protected by subjecting it to lateral frame movements. Frequently the tooth itself, or one or both opposite, may require slight rotation to develop free clearance, but such changes are easily and quickly made, and if the teeth are firmly fixed in hard wax, will not often require re-adjustment.

The molars and first bicuspid are then set, each being tested as was the preceding one, then the corresponding opposite teeth are similarly placed and proven.

The cuspids, laterals and centrals are next adjusted in the order mentioned and if too wide or narrow, the discrepancy is overcome by substitution or reduced by grinding.

Finally the balancing point is worked out, usually by tipping the two last molars, the upper backward and the lower forward, until their occlusal planes are parallel with the condyle path. This can readily be determined by lateral frame movements, and when correct the case is ready for waxing and trial in the mouth.

A hard variety of base plate wax should be used in constructing the rims and for waxing the teeth in position, in order that the teeth will not move under stress in the mouth.

The patient should be instructed to exercise the mandible freely in lateral and protrusive movements, the operator at the same time holding the lips and cheeks away and observing the relationship of the teeth in the various positions. Frequently a slip of carbon paper placed between the occlusal surfaces will disclose high points not otherwise noticeable and these can be corrected with a small engine stone.

The principal points to observe, however, is whether the balancing points of contact have been developed. The high point can be corrected in the finished case, but not so with the balancing points. These must be secured by the paralleling of the occlusal planes of the last molars with the condyle path as before stated. When these several points are worked out correctly the cases are ready for flasking.

A case in which a perfect impression has been secured, a model obtained from that and corrected as perfectly as possible, the anatomical condition worked out accurately and the flasking properly accomplished may be ruined or the adaptation seriously impaired in the packing and vulcanizing.

The cause, briefly stated, is due to the instability of plaster. Pulverized dental plaster has the formula $\text{CaSO}_4 \frac{1}{2} \text{H}_2\text{O}$. The calcined powder, when examined under the microscope, is seen to consist not wholly of amorphous granules, but with broken parallel-sided crystals of widely varying sizes interspersed. When mixed with water the half hydrate begins immediately to take up water and the di-hydrate is formed, formula $\text{CaSO}_4 2(\text{H}_2\text{O})$, the process going on for thirty-six hours or longer. If some freshly mixed plaster is placed on a slide and a cover glass pressed over it with a sliding motion so as to thin out the mass and render it transparent, when examined under the microscope, tufts of needle-shaped crystals will be seen to pile up on each other and, as the setting process goes on, other crystals will gradually be attracted to and form upon the mass already grouped. These crystals are long, delicate and needle-shaped and are grouped without order, lying very much like a bunch of jack straws, with many open, irregular spaces between.

These spaces may or may not become partially filled by the more slowly setting finer particles which crystalize in shorter needles later on.

In any event a plaster model which appears hard and resistant is composed of innumerable delicate crystals so grouped as to leave an intricate network of open spaces permeating the whole mass. Crystals of the character described will withstand stress up to a certain point, but will be instantly shattered when the modulus of resistance is reached.

If our eyes possessed microscopic power or the crystals of plaster were of microscopic size, we could see a most terrific convulsion occurring during the closing of an overpacked flask. Crystals shattering and flying in all directions, others bearing their load up to the modulus limit and merely breaking and, with others again maintaining their integrity and form, depending on the force exerted upon them. Each broken crystal on the face of a model paves the way for a misfit denture.

Assuming the modulus of resistance to be 5, the ratio of force ordinarily exerted in closing a flask ranges from 2 below to 35 in excess of the modulus. Is it any wonder that misfits occur?

How can this danger be obviated?

Use dry heat in warming the waxed case before separating. When open, remove all wax from the matrix that can possibly be taken away with instruments. A fine stream of boiling water directed into the matrix will almost instantly remove the residue. No water need be applied to the model since, if proper care has been taken, it will be free from wax.

The matrix is heated slowly over a flame, first, to drive off moisture, and, secondly, to aid in the packing of the rubber.

The old method of gauging the amount of wax in a water glass and using a like bulk of rubber in the packing is an easy and rapid and accurate plan to follow.

When packed, a piece of muslin from the rubber, freed from its starch by washing and wrung dry as possible is spread over the packed case. The flask is then closed as close as possible with the fingers and the bolts inserted, tightening the nuts only slightly.

Dry heat is then applied, the flask being turned at frequent intervals to present the various surfaces to the flame. When well heated, the wrench is used to tighten, applying not to exceed 5 pounds on the end of the wrench handle.

If necessary, reheat to obviate undue stress on the model. When closed, the bolts are removed and flask separated. Moisten the muslin with water applied with a pellet of cotton, when it will peel away from the rubber without difficulty.

Examine the packed matrix with a blunt, round-pointed instrument, pressing here and there to see that the mass is solid. A slight excess should show at the margins, although this is not imperative.

If deficient, add enough to make up the required amount and close the flask.

Place in a vulcanizer in the bottom of which is a block of wood, iron or preferably zinc about $\frac{3}{4}$ of an inch thick and $2\frac{1}{2}$ inches in diameter. This leaves a space between the walls of the vulcanizer and the block amply sufficient for the water, which should never cover the block. A cubic inch of water will make a cubic inch of steam, so don't be afraid of burning your case unless the vulcanizer leaks. As a matter of fact a teaspoonful of water is sufficient for a vulcanizer full of flasks.

It will be found that if the block on which the flask rests is of zinc, that the hydrogen sulphide which forms during vulcanization will attack it instead of the flasks or vulcanizer walls, they remaining clean while the zinc is gradually destroyed.

I have been taken to task for recommending this method, the claim being made that the presence of the zinc will cause porosity in the vulcanite.

We have since made accurate records of over 10,000 cases in our school laboratories, and in that number but three cases came out porous. These cases were very thick, which fact is self-explanatory.

The best quality, greatest density and most elastic properties are developed in rubber with less risk of porosity occurring if vulcanization is carried on at 290 degrees or lower for a time sufficient to harden, rather than at a higher temperature for a shorter period.

This method of vulcanization insures a dry model in which the plaster crystals are far more resistant to stress than when damp or saturated, during the closing of the flask and further insures the maintenance of the model in a comparatively dry condition in the early stages of vulcanization, or during the time when some pressure is exerted on the face of the model by the slight excess of rubber before hardening has occurred.

The finishing of a case is accomplished along the prevalent lines. The palatine and border surfaces, however, should be finished with pumice stone and a stiff brush wheel until as smooth as any other surface of the denture to prevent the accumulation of mucous plaques and debris. No fear need be entertained of interfering with the adaptation if ordinary care is exercised. The regrinding has been thoroughly explained by Dr. Pritchett and some further details will be enlarged upon in showing the slides relating to this subject. It is a regrettable fact that in some schools outside of Chicago the teaching of anatomical occlusion is sadly neglected. In some cases, in fact, the teachers say it is a delusion and a snare. No man with brains who ever tried the system can make such a statement. If true, then the Almighty blundered onto a happy system without realizing it. What is that little Arab Maxim: "He that knows not and knows not that he knows not is a fool."

Let me enjoin the members of our society with all the ardor I can command and with a confidence and a certainty based on practical experience, to put into practice the system here outlined. The results I am sure will be an uplift in the field of prosthesis that will redound to the credit of the profession and the benefit of humanity.—*Dental Review*, November, 1911.

STERILIZATION OF INSTRUMENTS.—Our instruments, when used in any one case, should be washed with brush and soap, steeped in formalin solution, and then be passed with forceps to a trap of alcohol. This is sufficient sterilization in all cases except when handling specifics, then the sterilization with its soda solution may be brought into requisition. Surgeons are finding that the temper of a blade is never improved by the formerly accepted plan of sterilization, and many are resorting to mechanical means of cleansing instruments, to be followed by the alcoholic bath. This has been found to be effective and it is the most satisfactory method for the dentist.—B. Holly Smith, *Dental Cosmos*.

“SWAT THE FLY.”

SOME interesting and instructive experiments were carried on recently at Ottawa concerning what may be called the danger zone of the house fly. It is pretty generally accepted that the individual house fly does not range over a great deal of territory, but experiments undertaken by the Dominion Entomologist prove conclusively that this theory is very much astray.

The experiments in question had to do with placing a smallpox hospital on Porter's Island, near Ottawa, as it led the Entomologist to gather statistics as to whether the house fly would actually travel the distance between Porter's Island and Ottawa city. In the course of the experiment some fourteen thousand flies were marked, the process being to spray the cages in which they were confined with a solution of rosolic acid and alcohol. These marked flies were then liberated on the island, while tanglefoot fly paper was distributed on the shores on either side of the mainland. After two days these pieces of fly paper were collected, and placed in a weak alkaline solution, the effect of which was to turn the marked flies scarlet. The result was that one hundred and seventy-two of those caught on the fly paper were found to have traveled the distance from Porter's Island.

One of the marked flies was also captured on Rideau Street, a distance as the crow flies of no less than seven hundred yards, considerably over one-third of a mile, from where it was liberated. Which all goes to show that taking care of your own back-yard along with that of your immediate neighbor is not going to protect you from these filthy pests and the dire results of infection caused by them in their travels.—*Saturday Night*.

PARAFFIN SEPARATING SOLUTION FOR PLASTER IMPRESSION.—A saturate solution of paraffin in gasoline makes a very satisfactory separator for plaster impressions. It dries quickly; the cast may be made in a few minutes after the paraffin solution has been applied, and there is no risk of the plaster of the impression and that of the cast uniting. It may be used so thin that none of the fine lines of the impression will be filled. It is desirable to first color the impression by staining with an aqueous solution of carmine or other preferred stain.—A. P. Kilbourne, *Dental Surgery*.



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Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

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FLUX FOR SOFT SOLDERING.—Pieces of zinc are dissolved in hydrochloric acid until the acid is saturated. The resultant solution of zinc chloride is mixed with an equal amount of a mixture consisting of aqua ammonia and alcohol. After standing a few days the solution is filtered and ready for use. The so-called Miller's soldering fluid consists of a solution of phosphoric acid in eight parts of water, to which one part each of lactic acid and glycerine has been added.—*The Dental Era*.

MATRIX FOR POURING PLASTER MOULDS.—Take a strip of tape two inches wide and eleven inches long and dip it into melted wax until saturated and allow it to cool. When wanted for use, warm slightly and wrap around the impression in the tray, to which it will snugly adhere. When the plaster has set it will readily peel off.—G. E. Truitt, *Cosmos*.

THE PREVENTION OF MOUTH-BREATHING.—It often happens that mouth-breathing continues after the removal of adenoids, frequently as a force of habit on the part of the patient. This will have to be broken up by attention being called to it and bandaging the mouth at night. The habit of mouth-breathing must be broken up at all hazards. Surgeons' adhesive plaster may be used to hold the lips together in sleep.—King S. Perry, Irwin, Pa., *Summary*.

CONTROLLING ALVEOLAR HEMORRHAGE.—Soften gutta percha and press it into the alveolar socket with a considerable excess. Have the patient bite into it to occlusion, and force the excess against the buccal and lingual surfaces. Take out and cool and trim away such portions as are not needed and make smooth. Replace and let the patient hold in place by closing the teeth. It makes an effective mechanical plug, which may be of use in retaining medicinal agents.—Dr. E. A. Bogue, *Journal*.

TREATING CAVITIES WITH NITRATE OF SILVER.—I believe it is a good practice when you have some evidence of a superficial decay to touch it with nitrate of silver and see how deep it will go. In a few weeks that will show you how far the area of decay has gone. Lots of times you need not go any further, as that will stop the decay.—J. N. Crouse, *Dental Digest*.

OXYGEN OVERCOMES OBJECTION TO NITROUS OXIDE.—The objection to nitrous oxide gas that it induces asphyxia can be overcome by combining sufficient oxygen with it to maintain a good degree of oxygen in the blood, with which modification it is unquestionably the safest of all agents wherever it is applicable.—Eli H. Young, M.D., Buffalo, N.Y.

REMOVING GLAZE FROM CARBORUNDUM STONES.—To renew carborundum stones that have become glazed from grinding down teeth containing amalgam fillings, place them in a beaker and cover with a 50 per cent. solution of nitric acid, allowing them to remain for two or three hours. Remove and place in a strong solution of sodium bicarbonate for several hours that the acid which has been absorbed by the stones may be neutralized.—W. H. Tweedle, *Dental Review*.

CARE OF TOOTH BRUSH.—The tooth brush may be kept sterile by taking a large size test tube and constricting it about one inch from the bottom, providing it with a rubber cork as a stopper and placing a little formalin tablet or formaldehyde, in the lower chamber. It will then become sterile without injury to the brush.—Dr. T. H. Hardgrove, *Office and Laboratory*.

PAINLESS PULP DEVITALIZATION.—As a solvent and soothing agent in pulp devitalization this remedy (campho-phenique) is most valuable. A devitalization paste of ten grams of arsenous acid ground finely with twenty grams of powdered cocain and moistened with campho-phenique, to make a creamy paste, makes an excellent and painless devitalization remedy.—Dr. B. L. Thorpe, *Brief*.

ALWAYS MAKE A CHARGE FOR TREATMENT.—A mistake frequently made by dentists is in not demanding proper compensation for the hours of work they spend in treating patients. It is more of an expenditure of energy to destroy a pulp, or to clean out a tooth that has a dead pulp in it, and get it in an aseptic condition and properly fill the canals than to put in any filling. The dentists of our state and of our country are spending much of their energy in doing this kind of work, in advising patients and getting practically nothing for it.—T. W. Brophy, *Dental Review*.

LACK OF CLEANLINESS.—The lack of cleanliness must damn any dentist who aspires to a high-class patronage. The reasons are too obvious to dwell on them.—W. T. Jackman, D.D.S., *Dental Summary*.

MISTAKES OF PARENTS.—Well-meaning parents are often in error in telling children of their own suffering in the dentist's chair; this prepares a child to do its worst, and makes it a coward at the outset. W. H. Whitslar.

SYMPTOMS OF NASAL OBSTRUCTION.—Briefly enumerated the signs and symptoms to be looked for are as follows: Most frequent and most characteristic is mouth breathing during all or part of the time, with noisy respiration or actual snoring at night. Restlessness during sleep with a tendency to awaken and call for water to relieve the extreme dryness of the mouth. Advanced cases will show a characteristic face, easier to recognize than to describe, with blunted mental activities, backwardness at school, from no apparent cause, and more rarely a history of nocturnal enuresis, or night-terrors, may be developed. Chronic cough, which is slightly productive and which becomes worse in winter and during periods of damp weather is present as a rule.—Francis Ashley Faught, M.D., D.D.S., Philadelphia, Pa., *Items*.

A LABORATORY HELP.—A piece of linoleum five or six inches square will be found to be a very convenient help in pouring up plaster models. It gives a flat base to the model, can be easily "peeled" off when the plaster is set, and does not chip or break as does a glass slot. It is a proper companion to the rubber bowl.—C. M. Torrence, Frankfurt, Germany.

ARRESTING HEMORRHAGE.—Artificial gelatin is made by combining gum arabic with perchlorid of iron, sterilized, and injected hypodermically. This is very efficient, as it increases the coagulability of the blood more actively than calcium chlorid.—*Monthly Cyclopedia and Medical Bulletin*.

CAST GOLD INLAYS.—In using occlusal gold inlays, the operator will find that a piece of rubber dam just large enough to cover the wax model, placed between the occluding teeth while the wax is soft, will make the articulating surface of the inlay occlude exactly, and there will be no grinding to do when the inlay is finished and polished.—*Dental Cosmos*.

AVOID, IF POSSIBLE, THE EXTRACTION OF TEETH FOR PATIENTS EXPOSED TO MUMPS.—Four days after the extraction of the roots of a lower first molar, the patient developed a case of mumps, and two days later, when the inflammation of the disease was at its worst, excessive hemorrhage occurred from the wound.



TORONTO DENTAL SOCIETY.

AT the meeting held on December 11, 1911, the guest of honor was Dr. J. Lowe Young of New York, who read a paper on "The Importance of the Normal Restoration of the Occlusal Surfaces." The essay was illustrated by a number of slides.

Dr. Young made an appeal for the normal restoration of all surfaces, but dealt in particular with the occlusal surfaces. He held that all grooves, ridges and sulci should be restored, and lamented the common practice of overlooking this matter in inlay construction, with the result that much of the power of mastication is lost and the natural locking of the cusps, in grooves and fossæ so important in the retention of teeth, is destroyed.

A number of models and slides were shown, illustrating the deleterious and often disastrous results due to lack of attention to this matter.

The essayist said these grooves, ridges, etc., might be carved in the wax or carved in the inlay with engraving tools. He referred to an exceedingly simple yet effective means of cutting and polishing the occlusal surface of inlays.

Take an ordinary flat circular ink eraser (those usually used by stenographers) and cut out a small disc about 3-8 of an inch in diameter and mount on mandrel. This particular rubber is hard, and contains sufficient grit to cut away the gold very freely. The rapidity with which these rubber discs cut down the gold is really surprising. For cutting out the rubber, Dr. Young recommended a tube of copper, sharpened on one end to a cutting edge. The rubber discs are thus cut perfectly even and round. They may be divided into two or three portions, according to the width of disc that is desired.

Dr. W. H. Doherty, who opened the discussion, stated that probably the greatest cause of failure in dental operations was a lack of thorough knowledge of the anatomy of the teeth and the sur-

rounding parts. Faulty contacts and improper restorations of proximal surfaces were responsible for many cases of caries in the adjacent tooth and also of incipient pyorrhoea. He outlined the natural provision for cleanliness in a normal, well-formed denture, showing that the friction of mastication should cleanse every surface not covered by gum tissue, and urged a careful reproduction of these conditions in restorations in the mouth. A number of upper and lower sets of teeth being carved by Freshmen at the Dental College were shown to illustrate the possibilities of normal reproductions.

Dr. A. E. Webster outlined the teaching in connection with gold fillings and amalgam, that the marginal ridge and deep fossæ should not be reproduced lest leverage from an opposing cusp break the filling or force it out of the cavity. In gold inlays where the inlay itself cannot be broken, and where there are greater possibilities of retention, this teaching does not apply, and he advocated moderate restoration of grooves, ridges, fossæ, etc., under these circumstances. Dr. Thornton said the manufacturers placed die-plates on the market because they claimed dentists could not carve normal occlusal surfaces. He did not think that this could be said to-day, and strongly advocated the carving of cusps in crown and bridge work as the only way in which the ideal reproduction could be obtained. At the close of a most profitable meeting a hearty vote of thanks was tendered Dr. Young.

A SUGGESTION ABOUT BASE PLATES.—When the base plate is returned to the cast, and it is found that the palatine portion of the base plate is not in contact with the cast, the operator often attempts a readoption of this part of the plate by pressing it down, and in so doing draws the impression of the occluding nearer the centre of the mouht. When the denture is finished the articulation of the artificial teeth with the natural is quite different from their arrangement on the articulator. No matter how much time you may spend in taking bites or articulating the teeth, there always follows a slight change in the articulation.—C. B. Voigt.

CONTROLLING HEMORRHAGES IN SETTING CROWNS AND BRIDGES.—In irritated conditions, where the gums have a tendency to weep and bleed, treat the gum margin with 15 per cent. solution of Trichloroacetic acid. I know of no other astringent that so absolutely controls such a condition in setting crowns and bridges and inlays, and at the same time having such a curative effect.—J. E. Argue, *Dental Review*.

ORAL HEALTH

EDITOR — — WALLACE SECCOMBE, D.D.S., TORONTO, ONT.

ASSOCIATE EDITORS } GEORGE K. THOMSON, D.D.S., HALIFAX, N.S.
{ W. H. DOHERTY, D. D. S., TORONTO, ONT.

A Monthly Journal devoted to the interests of the Dental Profession, and to the furtherance of Public Health through the education of the Public in relation to Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

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Vol. 2

TORONTO, JANUARY, 1912.

NO. 1

EDITORIAL.

NINETEEN-ELEVEN—NINETEEN-TWELVE.

WITH this issue "Oral Health" enters upon its second year. Quite a baby journal to be sure, but a mile-post has been reached and passed and we congratulate ourselves that the labors and joys of the past year have not been entirely in vain.

We are too optimistic,—too hopeful for the future to spend much time looking into the past; yet as a magazine we are constrained to turn about long enough to take a good look at our failures and a side glance at our successes. We have had both.

We turn toward 1912, fortified by the experiences of 1911, and full of hope that the cause of oral hygiene will be pressed forward and the dental profession led to take more advanced ground and occupy wider and higher fields. "Oral Health" confidently appeals to the members of the dental profession for their loyal support. We believe that there is a large field of service a journal such as this may cover. Among our hopes for next year we mention our desire to have the magazine read by medical practitioners and nurses as well as dentists. As a profession, we need the intelligent help and co-operation of both physician and nurse, and we believe "Oral Health" could in this way be made of great service to both the dental profession and the public.

Last year we were greatly hampered by very limited space. This year the magazine has been increased from 40 to 64 pages, and we hope to increase its usefulness in like proportion.

Members of the profession will be glad to learn that Dr. W. H. Doherty, Dental Inspector of Toronto Public schools, has become an associate editor of "Oral Health." Dr. Doherty is one of those "live wires" whose presence is felt because of the energy and power with which he is charged. There are few men anywhere to-day who can speak with greater authority upon oral hygiene in its relation to schools than Dr. Doherty, because of his opportunities for observation and his experience in school work.

We desire to thank our many subscribers for their financial assistance and the profession generally for its very generous support during the past year.

Just another word!

Have you subscribed for 1912?

When subscribing for 1912 ask for Reminder and Pledge Cards. These cards will be greatly appreciated by your patients, and particularly by the boys and girls. Simply make the request and the cards will be sent free of charge and post-paid.

THE 1912 UNION MEETING OF THE O. D. S. AND C.D.A.

Because of the many questions of national interest to be dealt with at this convention, and the marked effect their proper solution will have upon the future of the dental profession, every Canadian dentist ought to come to Burlington on June 3, 4, 5 and 6 next.

The convention will be an inspiration and an uplift. Mark the dates in your appointment book. Make this convention a fixed engagement, and keep it "fixed." Your presence is needed. The convention cannot be as great a success without you as it can and will be with you.

No convention ever had a more enthusiastic or more energetic local Committee of Management than this one. The committee is alive and looking for suggestions. Have you any to offer? What subject would you prefer to have discussed? What are some of your difficulties that you would like cleared up? Write "Oral Health." Your name need not be published.

* * * * *

Reform in the Army Dental Service has already been referred to in the columns of this journal as a question requiring some attention.

A national research committee and national questions concerning the Public Educational Campaign will no doubt also come up for discussion.

In regard to national public educational work, one of the questions of outstanding interest is that of the dental inspection of immigrants. At the present time no attention whatever is paid to the mouth conditions of Canadian immigrants. Officials are employed to detect disease, but shut their eyes completely to oral conditions of such character as calculated to cause infection and contagion.

This is a question of public health. It is also a matter of good citizenship. To compel immigrants to enter the country with a healthy mouth would start them upon the road to good citizenship. They would be led to a greater respect for their adopted country and a higher esteem for themselves. A mouth-health standard for immigrants would result in a greater stride toward public health and good citizenship than any other single attention the Government could bestow.

Not practical, you say? It undoubtedly is practical! Dental inspection of immigrants is one of the practical reforms that can be put into effect if the dental profession but seriously takes up the question.

* * * * *

Another important matter for the 1912 convention to arrange is for representation at the Child Welfare Exhibit, to be held in Montreal during October, 1912. Child welfare exhibits have already been held in Philadelphia, Boston and many other large cities, and have always proven of the deepest public interest and of the greatest educational value. Exhibits are made and discussions held covering every possible subject that affects a child's health and welfare. The Montreal exhibit is in charge of a committee, the secretary of which is W. H. Atherton, Ph.D., 62 Beaver Hall Hill, Montreal.

The C. D. A. might well arrange for a suitable presentation of the subject of the relationship between oral hygiene and child health and development.

* * * * *

By the way, doesn't it seem strange that most of our Canadian dental conventions stumble along without a Press and Publication Committee. We have long overlooked the educational value of properly written press reports of our conventions. Of equal importance is the work of editing the convention proceedings.

At present a stenographer is employed to take down the proceedings verbatim. This report is published without being gone over by a committee of the society, with the result that many statements that were perfectly clear when spoken do not appear in printed form as lucid or concise as they might. The average dentist is not an experienced public speaker, and in any case frequently speaks at a convention without preparation. The stenographic report is the official report of the convention and is valuable as such. The printed report of the discussions ought to be condensed and published in the best possible form. Readers are not interested in the exact words of the speaker so much as the points he made. Discussions ought to be published in concise and readable form, that the points made by the speaker will stand out clearly and be stated in the fewest words possible.

* * * * *

It would be impossible to overestimate the value of the big dental convention in Burlington. Be on hand to help with your presence and advice. In the meantime make any suggestions you see fit for the guidance of the Programme Committee. If you don't express your views now, don't complain if the programme doesn't include all the subjects you think it should.

TWO THOUSAND CONVERTS.

DURING the past few weeks the above number of children in Toronto public schools have been supplied with tooth-brushes through the school nurses. Arrangements were made with the Canadian Oral Prophylactic Association, Limited, to supply these brushes at a nominal cost. That this arrangement has been appreciated and is bearing fruit is evident from the fact that it has as yet been altogether impossible to supply the demand. As many more orders remain unfilled for want of brushes.

A recent examination of 516 kindergarten children in Toronto, including children from all classes of homes, showed only 70 who claimed to own a tooth-brush, while only a fraction of these showed the evidences of it. Right here lies the most fertile field of endeavor in the oral hygiene crusade. When the motto: "A Mouth as Clean as the Face" is recognized in the public schools, and in the home, that arch enemy of the human race—caries—will have been placed on the defensive.

THE CONDUCT OF DENTAL INSPECTION.

NO matter how thoroughly dental instruments are sterilized there is a popular prejudice against the use of mirrors, etc., in mouth after mouth during dental inspection. The use of sharp explorers also makes an accidental wounding of the tissues possible, and this is highly undesirable. Where the fingers are placed in the mouth at all the most careful washing and disinfecting of the hands becomes necessary. All this takes time, and even when carefully and thoroughly done leaves a doubt in the minds of parents and children.

All doubt of the aseptic nature of the inspection can be removed, and a great deal of time saved by the use of wooden tongue depressors, a clean, new one for each child. These depressors are about 6 inches long and $\frac{3}{4}$ of an inch wide, with rounded corners and quite smooth. In the use of a depressor to hold the cheek or lip away that the teeth may be seen, the fingers never come in contact with the mouth, and it is discarded as soon as the examination is made. The left hand need never touch the child except where it may be necessary to grasp the child's shoulder to steady it, if the examination is conducted with the child standing and the examiner sitting.

In this way a great number of children can be examined in a comparatively short time, sufficiently accurately for inspection purposes. Sterilization of instruments, and danger of infection through accidental wounding of the tissues are eliminated, as is also the doubtful process of wiping infection from hands to towel and back from towel to hands during the necessarily hurried examination of a large number of mouths.

DENTAL CLINICS IN SWEDEN.

AN article in the *London Daily Telegraph* states that Sweden leads the way in the establishment of dental clinics. With only a twelfth of Germany's population Sweden has at least a third of her total of dental clinics. Certainty of the fact that the State is pursuing the right line is made still more so by the unanimity among the teachers that the health and spirits of the children have sensibly improved. Toothache is seldom pleaded in excuse for absence and hand in hand with better attendance goes the closer attention to work made possible by mouth health.

DENTAL SERVICE AND THE QUESTION OF SUPPLIES.

DENTAL magazines nowadays are devoting considerable space to the very practical subject of business management of office, a proper fee for dental service and a proper method of arriving at such amount. Many splendid articles have already appeared. A campaign of education in relation to these matters is greatly needed, and will correct a condition which has long been recognize as a grievous weakness in the dental profession.

In the articles referred to the attention of the dentist has been directed away from the matter of dental supplies and toward the plan of charging for services rendered. *Under such a system the materials used become part of the service rendered.* The best results can only be attained by using the best materials, and except in hospitals and charitable work, there is no good reason why the very best materials should not be used.

It is incumbent upon the dentist to do the best he can for his patient not only in the *exercise of his skill*, but also in the *use of materials*. It is equally important that the dentist should charge a proper fee and use the best supplies he can procure..

The Cheap-John dental manufacturer who makes a low grade, just-as-good article is not a boon to the dental profession. He lowers the status of the profession, and the man who uses his goods is lowered in his own self-esteem.

Most dentists have a deep-seated conviction that platinum pin teeth are better than base metal pin teeth, yet, because the one is cheaper than the other, many are led to use base metal pin teeth. Such dentists are not rendering their best services, nor are they honest with their patients or with themselves. Such a policy is truly penny-wise and pound-foolish, for it is but a temporary gain of a few pennies and pounds of loss in self-respect.

The use of base metal dowels in crown and bridge work is likewise to be condemned. Reputations are sometimes made,—and broken, by the kind of dowel used. When a dentist removes a crown put on by his neighbor he unconsciously judges him by the kind of post used. When the post is proper-sized iridio-platinum your neighbor's stock goes up every time. You have a more healthy regard for him.

Coincident with the education of the dentist to charge a proper fee for the service he renders must go a campaign for the rendering by the dental surgeon of the best possible service, not only by the use of the best possible skill, but also the best dental materials procurable.

DONATION OF DENTAL EQUIPMENT.

THE Canadian Public School Nurses Association have offered to supply a dental chair and equipment for Earls court School, Toronto. This offer has been accepted by the Board of Education, and arrangements are being made for the installation.

THE PUNISHMENT SHOULD FIT THE CRIME.

IN a recent issue of the *Toronto Daily Star*, in "Everybody's Column," the following reply was given to the question, "How to Cure a Toothache?"

The toothache may be due to an abscess at the root. If this is the case the patient should go to bed and put hot applications to the face. The food should be warm and of such consistency as not to irritate the tooth. In a few days the abscess should be lanced by a physician or dentist. This is the time to go to the dentist. Nothing can be done before this except extract the tooth.

That a prominent newspaper should publish such a reply to this question is abundant evidence of the widespread need of education in matters pertaining to the teeth.

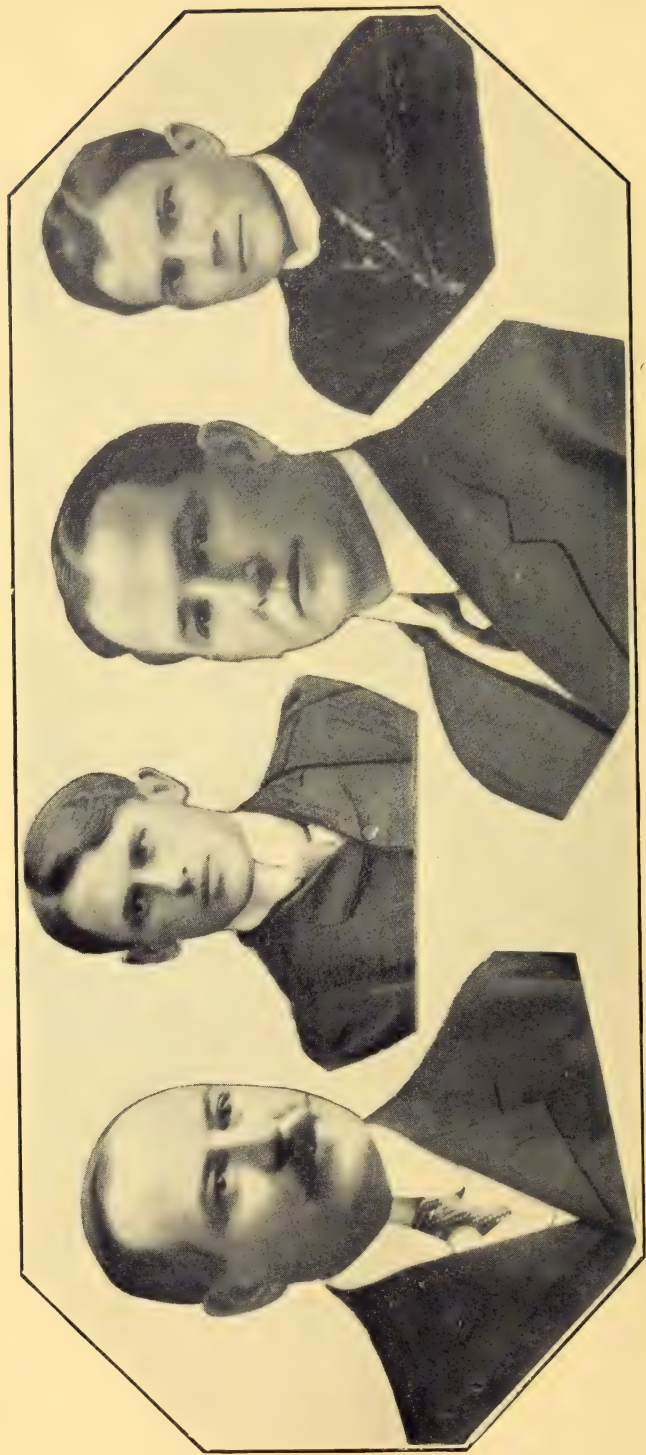
THE NATIONAL INSURANCE BILL.

THERE is no provision in the National Insurance Bill, just passed by the House of Lords, for the treatment of diseased mouths, other than that given by the physician. The disease, the prevalence of which Dr. Osler has characterized as a national disgrace, has been entirely ignored.

It will be interesting to find what will be done in the treatment of systemic disease plainly arising from oral sepsis! Indiscriminate extraction seems to be the only course possible. It remains to be seen if the Government will take the grave responsibility of placing so little value on the teeth, and particularly at a time when their vital importance is being generally recognized as never before.

The bill is strongly opposed by the medical profession on various grounds. In the light of the modern conception of the seriousness of septic mouths, and the extent of these conditions, in Britain, it would seem that, from the standpoint of public health, there is a lamentable omission from the escape of the bill.

“Ideals are like stars; we may
not reach them with our
hands, but, like the sea-
faring man on the de-
sert of waetrs, we
use them as our
guides, and by
following
them we
reach our
destin-
ation.



MEMBERS OF LOCAL COMMITTEE.
COMBINED ONTARIO AND CANADIAN DENTAL CONVENTION.

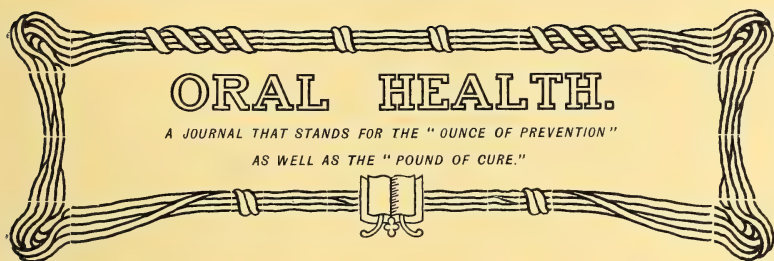
BURLINGTON, 3rd, 4th, 5th and 6th, June, 1912

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Vol. 2

TORONTO, FEBRUARY, 1912.

No. 2.

THE FIELD OF THE SCHOOL NURSE.

Specially Written for Oral Health.

BY LINA L. ROGERS, R.N.

Superintendent of School Nurses, Toronto.

MEDICAL and dental inspection of school children is one of the vital questions of the day. The cost of an elaborate system prevents many municipalities from considering it, but an experiment may be made with little outlay.

As the whole question is largely one of education, it seems logical and natural that the Board of Education is the proper body to control the work. The writer has had experience with both Boards of Education and Health, and has initiated the work where a staff of medical inspectors were already at work, and where there were none at all, and, therefore, knows the situation.

If a medical inspector is appointed alone, it is true that a child's defects may be found and diagnosed, and a notification sent to the parents; but what are the *results*? The children are excluded from school, and no one finds out whether instructions are carried out or not. They may get the necessary treatment, if the parents are wise, and able and willing to pay. *But what becomes of the child whose parents are neglectful or resistant, or who has no parents or guardian?* Simply this: He becomes a truant, misses not only his schooling, but fails to have the conditions he was excluded for remedied, and eventually becomes a street waif, and often an incorrigible, ultimately finding his way into the industrial school, or pehraps, later, the jail.

Put a nurse in the school to follow up these cases, and what is

the result? She goes immediately to the house after school hours, explains to the parents why the Medical Inspector sent the child home, how important it is for the future of the child and the country to have conditions remedied. If the parents cannot afford to pay for medical or dental treatment, the nurse at once sets about to find a way. There are dispensaries where the children may be taken, the free Dental Clinic; or individual doctors and dentists may always be found, who are willing to help out in emergencies.

It is not only the school child who benefits by this, for the nurse finds, in making her visits to the homes, both older and younger children who have not had the care they should have had. Even parents have learned to use the toothbrush, and have had their teeth attended to because of the nurses' educational campaign and the explanations given in the homes.

If there is any question whether a doctor or nurse should be employed, where only one can be paid, by all means have a nurse. It will not be long before she will prove how necessary it is to have a doctor, and means will be forthcoming. A nurse engaged by a community can refer all her cases to their own physicians or dentists for diagnosis and treatment, or to the dispensary, or there are those who will volunteer such service until medical and dental inspectors are appointed.

A nurse does not need to diagnose decayed teeth. She sees at once that there is something abnormal, and straightway announces that it must be attended to. When she points out to the parents what will happen if it is not cared for at once that the child cannot properly masticate its food, and that, therefore, its constitution is weakened, leaving it exposed to any and all diseases, do you not think they will begin to realize that possibly the proverbial ounce of prevention is better than a pound of cure? One dollar spent on a child's teeth at the proper time will perhaps save one hundred dollars later on.

In one of the schools in Toronto five children were found in one family, whose teeth were indescribable. Two were sent to a dentist, who offered to put them in the best possible condition; the others were sent to the Dental College, one boy requiring four crowns to replace lost incisors. They are now all carefully brushing their teeth, and not only that, but come to school with clean hands, faces and clothes, which was not the rule before. The father works hard to keep the family together, and the twelve-year-old girl does the housework, besides going to school, the mother having died two years ago.

Is all this worth while? Consider what the country has saved through this one source, and it is only one of many. Toronto is very fortunate in having made such a good start along dental lines in its medical inspection system, and Dr. Doherty, our ambitious dental inspector, is sparing no effort to make it one of the best.

During the year 1,744 children have had their dental work completed, and as many more are under care at the present time.

Seventy-five hundred toothbrushes have been provided for the school children, at five cents each, by the Board of Education, and the majority of those children had never used a toothbrush before. The interest shown by the dentists of the city in this campaign of clean teeth is evidenced by the fact that one busy man gave twenty-two hours of his office time to put two children's teeth in repair. Another gave eighteen hours, and saved much suffering for a girl who had been woefully neglected.

Our thanks are due to such men as these, who have done the work so unselfishly, and whose loss of time meant many dollars to them. With a dental hospital in view in the near future, we have reason to hope that the day of oral prophylaxis has surely come to stay, and that soon anyone with unclean or decayed teeth will be considered a member of a race belonging to the dark ages.

PHYSICAL WELFARE OF COUNTRY CHILDREN.

IF a country's best asset is its men and women, no pains should be spared to conserve the physical welfare of its boys and girls. In a work so important there are three forces that should co-operate: the home, the school, and the Government. If any one of these three fails to carry out its part in this work the boys and girls inevitably suffer. Parents are anxious that their children should be healthy and vigorous, but very often they are lacking in the knowledge essential to promoting their wish. A dull, sickly pupil is a heartbreak to an energetic teacher, but the teacher, too, is frequently unable, through lack of special training, to locate the pupil's physical limitations. The Government is ready to do its utmost for its future citizens, but stands helpless because there are no ways and means of carrying out its good intentions.

In the meantime the children bear the burden, and because nothing is done in their behalf, go through life needlessly and heavily handicapped. This unhappy state of affairs is all too much in evidence in country districts, where, so far as our schools are concerned, practically nothing is being done for the physical welfare of the boys and girls. The spread of infectious diseases is a case in point. The ignorance and indifference of parents and school teachers to such loathsome maladies as measles, scarlet fever, and whooping-cough is a menace to the public health. Then there are the evils that follow upon the deplorable conditions of children's teeth. Stockmen who would attend immediately to a horse with bad teeth pay little attention to their children's teeth, though actual examination proves that more than eighty per cent. of children of school age suffer all the evils of malnutrition and arrested development that result from this handicap. Further, a large number of children suffer from adenoids, or similar nasal obstructions that result in a mischievous disturbance of the whole physical condition.

Few realize that such abnormal conditions are serious in the extreme, resulting in malformation of the chest, disturbance of the facial color, obstruction of the hearing, poor circulation in the brain, with consequent dulness, headache, giddiness, and stupidity. Bodily vigor is impossible, and if the child survives at all he is but a miserable second best of what he ought to be. The pity of it is that these conditions go unremedied, when a little timely skilled attention would accomplish so much for the sufferers throughout life. Parents and teachers alike should be made aware that many of these defects or growths can be remedied by the skilled surgeon, and by the skilled surgeon alone, while they simply defy the best home regimen in the world.

The plan suggested for the correction of these untoward conditions in country schools is to prepare the teacher for the discovery of the more obvious and deleterious to the physical well-being of the children under their care. The teacher should know the symptoms of those contagious and infectious diseases that are the special bane of childhood, and it should be made an imperative part of the teacher's duty to exclude such a child from school till the family physician gives authority in writing for the child's re-admission to school privileges. Further, the teacher should be trained to detect defects in sight and hearing, and to discover such abnormalities as adenoids and enlarged tonsils. There is no doubt in the minds of physicians that teachers can readily and efficiently be trained for this work.

The teacher, it must be remembered, is not expected to do any-

thing of a remedial character in such cases beyond discovering the child's disability and informing the parent, by means of a prescribed form, of the child's abnormal condition. Cities and towns will have their staff of specially qualified school doctors and school nurses for this work. Such facilities are at present out of the question for country districts, but if the rural school teacher be made a part of the system whose object is the preservation and conservation of rural health, a great stride will be taken towards the welfare of the rising generation.—Editorial from *The Globe*, Toronto.

COMMON DRINKING CUPS ARE BARRED IN THE PROVINCE OF ALBERTA.

TO use a common drinking cup is an offence against the law in the Province of Alberta. Even to provide one for drinking purposes is against the law.

A section of the Public Health Act of 1910 has gone into effect within the last few weeks. It reads:

“On and after the first day of January, 1912, no cup, glass or other utensil used for drinking purposes, ordinarily known as a ‘common drinking cup,’ in schools, hotels, boarding houses, apartment houses, tenement buildings, theatres, public buildings, and factories, or in connection with any public drinking fountain or water faucet, in any street or park, shall be provided for the common public use.”

When the import of that ordinance is first realized it strikes one as being extremely drastic. But it is all in the interests of public health. It is understood that the sources of contamination cannot be too carefully guarded.

But public drinking cups are not to be done away with without the Provincial Health Department being able to offer something in exchange. Many means can be found for providing ample undiluted water without having to use cups from which all sorts and conditions of men drink.

The ever-flowing jet is considered the best. For certain uses there are patent cups. Glass cups easily cleansible and not easily breakable, can be had. Other inventions are also known.

CUPS IN SCHOOLS.

The idea of doing away with drinking cups in the public schools has been accepted favorably by the city authorities for some time,

according to Dr. Whitelaw, the Municipal Health Officer. But he is of the opinion that in those schools in which the cups have not been abolished, or other provision made for the scholars' drinking, the School Board will have to see that the necessary changes be instituted.

All the cups at the public drinking fountains will be removed. Dr. Whitelaw has already made provision for the erection of a "jet spurt" fountain in Edmonton. Probably more of these will be installed throughout the city, and in the better class hotels and all the schools.

The City Health Officer does not quite comprehend how the Act will be carried out with any degree of stringency at first, for it must be observed more in the breach than in the observance at the start. He expects that the Provincial Health Department will advise the municipal health departments as to how the law is to be enforced.

This is being done for the hotels by the License Department of the Provincial Government. Communications are being addressed to all licensed hotels in the Province.

ORAL HYGIENE AMONG THE SOMALI TRIBE.

IT is stated that 90 per cent. of the children of London, Eng., have decayed teeth, and it is an admitted fact that in all civilized countries the majority of people suffer from bad teeth. In India, Africa, and other parts where people live on simple diet, only a small minority have defective molars. For instance, there are some hundreds of natives at the "White City," Shepherd's Bush, and inquiries have elicited the astonishing fact that between them they do not possess a dozen bad teeth. Even the aged men and women have better preserved teeth than many a London child. The members of the Somali tribe are noted for their big and strong teeth, which glisten like pearls. The chief of the Somalis informed a press representative that they never use tooth powder, but constantly rub their teeth with a little piece of stick. When in their infancy, the children are made to use these pieces of wood several times daily, and eventually it became a habit. They are to be seen in their kraals in the Somali village diligently plying the spongy stick, regarding it as a kind of pastime—and their teeth are beautiful. "We have strong teeth and keep them many years," the chief said, "because we are always polishing them. We never eat sweets; we do not like sweet things, and we are very particular as to our diet. In Somaliland we eat no bread, but have rice instead. Dates, milk and mutton are the other staple foods. My advice to parents is to make their children clean their teeth with a piece of stick several times a day."—(Dental Surgeon)—*Cosmos*.

THE ORAL MICRO-ORGANISMS: A BACTERIO-CHEMICAL STUDY OF DENTAL CARIES.*

BY ALFRED P. LOTHROP.

(From the Laboratory of Biological Chemistry of Columbia University, at the College of Physicians and Surgeons, New York City.)

1. HISTORICAL REVIEW.

DENTAL caries is one of the most commonly occurrent of all diseases. Its ravages are seen in mouths of persons who are very particular in every point of personal cleanliness and oral hygiene, while perfect immunity is often found in mouths of those who pay little or no attention to keeping the oral cavity in a clean and antiseptic condition. The cause has been sought in the chemical composition of the saliva, and the presence or absence of sulfocyanate, for instance, have been held by many to give immunity or lead to decay as the case might be. Dosage with potassium sulfocyanate has even been widely advocated to bring about a condition of immunity to decay.

Many interesting and important theories (1) have been advanced regarding the causative factors of dental disease. The stagnation of depraved juices in the teeth was first designated by Hippocrates in 456 B. C. as the cause of toothache. This theory was held for many centuries, in fact up to the end of the eighteenth century. Galen in 131 A. D. attributed the cause of decay to disturbances of nutrition and loosening of teeth to an "excess of moisture which impairs the nerves." By many writers up to recent times tooth decay has been regarded as a process of inflammation, but the advocates of this theory ignore many facts completely, such as the decay of pulpless teeth and dead teeth worn on plates. The operation of filling teeth is itself an argument against this theory, as no inflammatory process is set up in boring into the structure.

Worms have been regarded as an essential factor in the origin of decay and Chinese dentists have evolved a scheme for making the superstition that worms are the cause of toothache pay among the lower class of ignorant people. In treating toothache "they are in the habit of making an incision into the gum to let the worms

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out. For this purpose they employ an instrument which has a hollow handle filled with artificial worms. When the incision is made the operator, by a dexterous turn of the instrument, drops the worms in to the mouth; the excitement of the patient and the loss of blood cause at least a temporary relief. The worms are collected, dried and are then ready to be taken out of the next patient's gums."

Putrefaction has also been regarded as the cause of decay, although not generally accepted. The chemical theory of caries has had a very large number of distinguished advocates, who believed that it was caused by acids formed by fermentation going on in the mouth, but in this instance only the decalcification of the enamel is accounted for, which leaves unexplained the liquifaction of the matrix and the formation of cavities in the dentine.

A theory, which is more of a curiosity than a theory of decay, is the electrical notion of Bridgeman, presented to the Odontological Society of Great Britain in 1861. His essay won the prize offered for the best treatise on dental decay. He regarded the human mouth as a galvanic battery; the individual teeth representing the different elements and the secretions being a common electrolyte. The electric current generated between the two parts produced an electrolytic decomposition of the mouth fluids and the acids formed caused decalcification.

Caries has been interpreted (2) as an infectious disease working its way outward from within. The idea has also been presented that ptyalin performs an important role, in that it forms acid from the sugar derived from starch. In this case we have the untenable view of the destruction of tissue by an enzyme in the secretion which normally bathes it, as would be the case in auto digestion of the stomach by pepsin. It has been claimed (3) also, that caries results solely from the action of mucin upon the teeth which is liberated from its salts by the presence of some weak acid.

Sim Wallace (4) in his book, "The Cause of Decay in Teeth," holds that "the cause of the prevalence of dental caries is that the natural food stuffs are to a large extent ridded of their accompanying fibrous parts and consequently in mastication the teeth are not cleansed by fibrous elements of the food."

The popular idea that difference in the physical qualities of the teeth such as the percentage of lime salts account for the phenomena of decay was disproved by Black (5) in a very exhaustive and careful investigation on the physical character of teeth. He found that differences in percentage of lime salts has no influence as to the liability to caries and that the active cause is a thing apart

acting from without. The cause of caries is not dependent upon any conditions of tissues of the teeth, but on conditions of their environment and imperfections are causes only in the sense of giving opportunity for the action of causes that induce caries. His conclusions have not been generally accepted and there are still many (6) who believe that deficiency of lime salts is a very important factor.

The parasitic theory of dental caries, which is the generally accepted theory at the present time, was placed upon a firm foundation by the brilliant researches of Dr. W. D. Miller. He demonstrated that decay is brought about through the agency of micro-organisms present in the oral cavity, which produce acids by the fermentation of carbohydrate material. The bacteria also secrete proteolytic enzymes, which destroy the dentine after the calcium salts have been dissolved out by the acid. Miller was successful in artificially producing caries of the teeth which could not be distinguished from natural decay. "His work on the etiology of dental caries is a classic. * * * It was this work which at once brought him into prominence before the scientific world and secured him a position among investigators of the first rank with a status in the dental profession equivalent to that enjoyed by Pasteur and Koch in medical science." (7)

The Dutch scientist, Leeuwenhoek, (8) was the first to discover the presence of microscopically small organisms in the human mouth (1683), and was able to describe several, among which was the motile *Spirillum sputugenum* now so well known. Prof. Erdl (9) was probably the first to accuse micro-organisms of being concerned in the production of decay (1843), although the credit is usually given to the Dresden physician, Ficinus, (1845) who described organisms which he called "denticolae," which on decomposition attacked the enamel, and after thus gaining entrance caused the destruction of the dentine. Leber and Rottenstein (9) in 1867 further advanced the parasitic theory, although they combined it with the purely chemical idea of the commencement of decay. They held that after the enamel and dentine had become partially decalcified an organism called *Leptothrix buccalis* worked its way into the tubules, distending them and making the way clear for the further action of acid. They also tried to produce decay artificially by placing teeth in a mixture of common food products, which putrefied and became alkaline so that no caries was produced. They did not realize the necessity of acid fermentation to begin the tooth destruction, and, as their results were negative, concluded that the action was not due to bacterial growth.

The next contribution of importance was made by Miller and Underwood (9) (1881), who rejected the chemical theory and ad-

vanced the idea that the acids causing destruction were secreted by the germs themselves which they always found present. This was a great step in advance as it for the first time definitely accounted for the source of the acid. Interest was revived by their contribution which stimulated many workers, and during the next decade a large amount of research was done upon this important question begun by Dr. Miller and followed by many other workers.

The mouth presents an ideal habitation for bacteria, which are the most widespread of living things, and it is not surprising that a very large number of different kinds of bacteria have been found in the mouth under all sorts of conditions. There are a few varieties which are met with only in the mouth and which will not grow outside on any culture medium so far devised. Others, such as the *Bacillus coli communis* normally present in large numbers in the intestines of animals, have been isolated from the mouth frequently. Bacteria are very sensitive to their surroundings and often are killed by the products of their own growth. For instance, acid producing bacteria will develop only a certain concentration of acid in the media unless some substance is added to neutralize the acid as fast as it is formed. Someone with a genius for mathematical possibilities has estimated that a single bacillus which reproduces itself by binary fission once every half hour, will in two days have developed 281 billion bacteria, occupying a volume of half a liter, which in three days more would produce a mass sufficient to fill the beds of all the oceans on the globe, the number being represented by 37 places of figures. No such development, of course, takes place on account of the lack of nourishment, sensitiveness of the bacteria to their environment, and other reasons. Many products are formed as a result of bacterial activity, among which may be mentioned gases, acid and alkali, heat, phosphorescence, pigments, and many kinds of enzymes. Many pathogenic bacteria form poisons or toxins and the symptoms of the disease are due to the absorption of these poisons.

The constant presence of bacteria in the air makes it necessary that all materials used be freed from organisms naturally present, for, unless this is done, it is not possible to determine whether the colonies that develop come from the materials used or from the substances used for inoculation. The most important single item in bacteriological technique is the necessity of obtaining pure cultures of organisms under investigation, and it is often very difficult to obtain the desired results, owing to the ease with which some species of bacteria outgrow and overrun others. This is especially true of the mouth bacteria, many of which it is very hard to grow on artificial media. While a small colony may develop some other more prolific species quickly spreads over the whole surface and destroys

the weaker species. A gelatin or agar plate exposed to the air for a very short time will develop colonies when incubated, and there are everywhere present organisms ready to develop when favorable conditions present themselves. In the study and description of bacteria it is very important for future workers that standard media be used and that full and detailed description of the growth of a species in the commonly used media be given.

In discussing the oral micro-organisms it might be well to consider first, some of the pathogenic organisms that have been isolated; second, bacteria found only in the mouth; third, those that have been especially connected with dental caries and other diseases such as pyorrhea and pulp gangrene; and finally, bacteria of infrequent occurrence.

Many pathogenic bacteria have from time to time been obtained from the mouth cavity, sometimes by cultural methods, but preferably from animals inoculated with saliva. That human saliva under certain circumstances may have poisonous effects has been known for many centuries. Aristotle referred to a girl whose bite was as poisonous as a snake bite. Of course the earlier writers did not associate the poisoning caused by the injection of saliva with the presence of bacteria, but considered it due to some poisonous constituent, for example, Eberle (10) attributed it to sulfoeyanate and thought he was able to detect an increase in the sulfoeyanate content during fits of anger. In 1881 two French workers (11) injected rabbits with saliva from a child suffering from hydrophobia. The rabbits succumbed and the poisoning was referred by them to the presence of micro-organisms, although the disease produced was probably septicaemia, surely not hydrophobia, as it proved fatal in 48 hours. Various investigations have proved beyond doubt that there are organisms invariably present in the mouth that will cause severe infection if injected into the circulation of animals in sufficient numbers.

As on every question relating to diseased conditions of the mouth we find extensive work by Miller (12) on the pathogenic bacteria. In 1891 he published an article containing a list of 38 diseases directly traceable to germs growing in the mouth, with a tabulation of 149 cases. The germs reached the circulation in most cases through decayed teeth and occasionally through wounds made by instruments. At the same time he described completely and in detail the most common of the pathogenic bacteria and mentioned many rare ones, twenty-three in all. Biondi (13) also made a valuable contribution to the knowledge of the pathogenic bacteria. Kenneth W. Goadby (14) in his book "The Mycology of the Mouth," has written a very complete chapter on the "Pathogenic Bacteria of the Mouth."

Among the pathogenic disease-producing organisms perhaps the most common is the pneumococcus, the diplococcus of pneumonia. Natural resistance ordinarily keeps the organism from obtaining the upper hand, but it develops frequently associated with other diseases, and after exposure when vitality has been greatly reduced. These cocci are constantly present in the air and in many mouths, but it is very difficult to cultivate it directly from the saliva and its presence is usually shown by inoculating a susceptible animal such as the rabbit with saliva. Thus the neglected oral cavity furnishes a dangerous source of infection to pneumonia. Very virulent pneumococci have been demonstrated in mouths of perfectly healthy individuals, but those isolated differ considerably in their virulence. Cook (15) found the pneumococcus in the mouths of 56 out of 220 school children examined.

Streptococcus pyogenes, the organism associated with erysipelas and pyaemia, and other varieties of pus forming cocci such as the *staphylococcus aureus*, *albus*, and *citreus* are often found in the mouth. There seems to be a difference of opinion as to the occurrence of these pus forming organisms, Netter (16), Vignal (17), and Miller (18) having found them only occasionally, while Black (19) believes them to be present in the majority of cases, having found the *S. aureus* in seven out of ten healthy mouths examined. Goadby reports finding it in about 10 per cent. of the cases examined (1,000 mouths). Miller admits that he never paid particular attention to these organisms. Sanarelli (20) claims that the saliva has bactericidal power for the *S. aureus*, but this power is quantitative and insufficient to deal with large numbers. *Micrococcus tetragenous* is often present in normal saliva and in dento-alveolar abscesses, and was first studied by Koch who found it in tubercular persons. It is peculiar in that the cocci are arranged in groups of four. It has been isolated by Miller, Biondi (13) and others.

The Klebs-Loeffler or bacillus of diphtheria occurs in the mouth more frequently than is usually recognized by dentists, and may be transferred from mouth to mouth without causing the disease until it reaches a susceptible individual, who succumbs to the infection. Its presence has been shown in the mouths of about 33 per cent. of those who have been exposed to infection and in one investigation virulent bacilli were found in 41.5 per cent. out of 214 persons who had been exposed. Cook (21) found the diphtheria bacillus in 14 out of 186 mouths examined.

Another very common disease which may gain a foothold through lesions in the mouth is tuberculosis. It is often difficult to demonstrate the presence of the tubercle bacillus in the saliva of persons known to be suffering from the disease, but the work of

Cook (21) who investigated the mouths of 220 persons with special reference to this organism, points to the conclusion that the pulp canals often become tuberculous and are a ready means of glandular infection. Carious teeth provide a point of lowered resistance in the form of inflamed tissue where the organisms eventually gain a foothold.

There are many recorded cases of syphilis which have been transmitted by means of saliva or instruments used in the mouth of patients suffering from that disease and from transplantation of teeth which were not properly sterilized. Among the other pathogenic bacteria may be mentioned the *Bacillus pyocyaneus*, the bacillus of "blue pus," so named because of the pigments produced. It occurs occasionally. A disease of cattle, actinomycosis, has been transmitted to man, the organism, *Streptothrix actinomyces*, gaining access through a carious tooth or an injury to the mucous membrane. Miller (22) describes four organisms, which he found occasionally present in unhealthy mouths, which were pathogenic for mice. These he named *Bacillus gingivae pyogenes*, *Bacillus dentalis viridans*, *Bacillus pulpa pyogenes*, and *Micrococcus gingivae pyogenes*.

Many other cases are on record of diseases that could be traced to infection in the mouth, but those already cited are sufficient to indicate the necessity on the part of dentists of exercising great care in the matter of liberal use of antiseptics and the thorough sterilization of instruments.

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The bacteria of decay produce their effect in two ways: first, acid is produced by fermentation which attacks the inorganic salts of the tooth abstracting the calcium, and second, proteolytic enzymes are formed which liquefy and digest the organic constituents of dentine after removal of the lime salts. Miller (28) showed this process experimentally by producing artificial caries which could not be distinguished under the microscope from natural decay.

The formation of the "bacterial plaque" under which bacteria develop freely and carry on their work of destruction is a phenomenon familiar to all dentists. Authors differ as to whether its presence is essential. To quote: "Caries of the teeth has its beginnings when the conditions of the mouth are such that micro-organisms causing caries form gelatinous plaques, by which they are glued to the surface of the teeth" (Black). Miller (29) claimed that bacteria are not glue makers, as that would prevent access of food. The film represents a growth in or upon enamel cuticle and is not mechanically attached to the enamel itself. On dentine they

are attached directly and mechanically. They form wherever the surface of the tooth is not kept free from mucous, epithelium, food, etc., and are often present on teeth showing absolutely no trace of caries. They generally accompany the carious process but not always, and do not necessarily give rise to caries. Again he writes: "Bacterial plaques are *essential* neither to the beginning nor progress of caries, nor does their presence necessarily result in its production. They may intensify the process of decomposition in food particles clinging to tooth surfaces" (30). Goadby (31) has frequently demonstrated plaque formation artificially.

All investigators agree that caries is not a disease due to a special micro-organism, but that any bacteria which produce acids can prepare the tooth for the further action of proteolytic enzymes that destroy the matrix. The bacteria found in the superficial layers of dentine are both acid producers and liquefiers, while those found in the deeper layers are acid producers only. Hard undecalcified dentine is not effected by enzymes unless first acted upon by acids.

It is noticeable that the liquefying bacteria belong to the class of bacilli while the acid forming organisms with one exception are cocci.

Of the above mentioned organisms by far the most commonly occurrent is the *Streptococcus brevis* (the micrococcus *nexifer* of Miller (33)) which occurs in practically every mouth and is often the only organism found in a healthy mouth. Goadby (34) reports that he has never failed to find it and that it is also by no means confined to the human mouth but has been observed in monkeys, dogs, rabbits and guinea-pigs. It grows very rapidly in almost all media to the exclusion of other organisms. It differs from the ordinary streptococcus form in that it occurs usually around epithelial cells as diplococci, rarely in chains. It produces a strong acid reaction in carbohydrate media, and is not pathogenic when injected subcutaneously or intraperitoneally. The streptococcus is more frequent in the mouths of children than in adults (35).

ACID FORMING BACTERIA.

Deep layers of carious dentine.

Streptococcus brevis
Bacillus necrodentalis
Staphylococcus albus

Superficial layers.

Streptococcus brevis
Sarcina lutea
Sarcina aurantiaca
Sarcina alba
Staphylococcus albus
 " *aureus*

BACTERIA WHICH LIQUIFY DECALCIFIED DENTINE.

None isolated from deep layers of dentine.

Superficial layers.

Bacillus	mesentericus	ruber
"	"	vulgatus
"	"	fuscus
"	"	furvus
"	gingivae	pyogenes
"	liquefasciens	fluorescens motilis
"	subtilis	
"	plexiformis	

Proteus Zenkeri

The *Bacillus subtilis* is the common hay bacillus found in soil and abundantly on hay and is a very large bacillus much resembling the deadly anthrax. It is motile and forms spores and is very sensitive to acids. Two of the organisms, *Bacillus necro dentalis* and *plexiformis* are new species isolated and named by Goadby (36). Vignal (37) in 1886 isolated seventeen kinds of bacteria, which he obtained in pure culture, which he designated for the most part by letters. Many of these have later been identified with well known species. Choquet (38) described five organisms isolated from carious dentine but used special media only, so that their identification with known species is impossible. Black (39) has described a gelatin-forming coccus which perfectly gelatinized 2 per cent. sugar-peptone broth in 24 hours. It was found far back on the dorsum of the tongue and occasionally scattered throughout the mouth. It was a difficult organism to keep alive. Goadby (40) also often encountered a series of bacteria which formed tough gelatinous colonies on media entirely free from carbohydrate. One species he has named *Staphylococcus viscosus*. Its growth on agar was extremely viscous and the whole mass could be wound up on a platinum needle. Miller (41) has also described a pathogenic yeast fungus and others have met with various species of fungi in the oral cavity. It has been claimed (42) that the bacteria found in children's mouths are more virulent than those in adult mouths.

Excellent results have been reported (43) in the treatment of rampant caries by crowding out acid producing organisms. This was accomplished by sowing in the mouth spores of the *Bacillus mesentericus vulgatus* which does not ferment carbohydrates, but tends to produce an alkaline reaction and by-products inimical to acid producers.

In investigating the bacteriology of pulp gangrene, Arkovy (44) found present in 95 per cent. of the cases examined an organism which he called *Bacillus gangrene pulpae*. Associated with it he

found the *Staphylococcus aureus* in 34 per cent. of the pulps, *Streptococcus pyogenes* in 23 per cent., and other varieties in a smaller number of cases. Cook (45) isolated the same organism in 34 out of 40 cases examined, but found it always associated with other bacteria, so that it is certain that no one micro-organism is wholly concerned in the causation of the disease. Sieberth (46) and Goadby (47) on the other hand, were not able to isolate the bacillus of Arkovy and believe that it corresponds to one of the bacilli of the Mesentericus group. Miller (48) examined 250 tooth pulps and constantly met with pathogenic cocci which he considered the organisms most concerned in pulp destruction. Masses of putrid pulp inoculated into animals caused tissue necrosis and death in three or four days. Many of the organisms found in carious teeth naturally find their way into the pulp chamber and have thus been often found in cases of pulp gangrene.

A large number of bacteria are found in the pus of pyorrhea, but so far great difficulty has been encountered in obtaining pure cultures of the organisms seen in cover slip preparations. Galippe (49) isolated two species which produced general abscess formation when injected into animals. One organism produced abscesses in the joints and the other intramuscular lesions. Investigators agree in regard to the infrequency in which the common pus cocci are found in pyorrheal pus. In 43 cases Miller found the *S. aureus* but three times and the *S. albus* twice, while Goadby (50) found them present to the extent of exactly 10 per cent. in 150 cases examined. Arkovy (51) found what he considered phase forms of the *Leptothrix racemosa* in cases of pyorrhea. Certain facts point to the presence of a toxic element in pyorrhea, although it is not possible to associate any definitely isolated bacterium with this disease. The products of the growth of the organisms in pyorrhea are extremely pathogenic for animals and the health of persons suffering from this disease is undoubtedly seriously affected by the continual swallowing of these organisms and their products. Some individuals with toxic mouth conditions show no signs of poisoning and there may be an antitoxin formation which creates a condition of tolerance. Treatment of acute pyorrhea through the use of specific vaccines has met with some success (52).

Among other bacteria found in the oral cavity by various workers which have not been referred to might be mentioned the *B. coli communis* (a very widely distributed organism), the Hoffmann's bacillus (pseudo-diphtheria), *B. Friedlander* (pneumo bacillus), *B. influenzae*, *B. Luteus*, *B. buccalis minutus* (Vignal g.), *B. buccalis fortuitus* (Vignal j), Bacillus B of Vignal, Bacillus G of Vignal, *Micrococcus roseus*, and *Vibrio Finkler-Prior*.

The same bacteria are found in immune and rapidly decaying mouths and will grow readily in the saliva of either. Black (53) holds that susceptibility or immunity is not related to any question of antiseptics, but it is in some degree probably related to a development of antitoxins, although different in many respects. After an exhaustive study of the question of immunity Miller (54) arrived at the following conclusions: Mixed human saliva does not possess the power to prevent or retard processes of fermentation or putrefaction and has no bactericidal power. Potassium sulfocyanate does not possess appreciable antiseptic action in the greatest concentrations ever met with in the mouth. The saliva of immunes develops in the presence of carbohydrates on an average a little less acid than that of susceptibles, but the difference is not sufficiently marked to account for the marked differences in susceptibility. The protective bodies in the blood do not pass into the saliva in sufficient quantity to be detected by ordinary means. The struggle for existence probably performs an important role against the invasion of the pathogenic micro-organisms and in restricting the growth of mouth bacteria. Miller (55) also found a more rapid development of bacteria in fluid particles impregnated with alkaline saliva with a final production of slightly more acid than when the saliva is acid to begin with. The character of the food has a great influence and tooth structure is an important factor. The action of viscosity of saliva as a causative factor has been somewhat overrated.

In regard to the comparative number of bacteria in different mouths figures obtained by Miller are of interest.

No of bacteria per loop of saliva:

	Average.	Extreme.
Immune	65,000	15,000 to 95,000
Slight caries	34,000	18,000 to 50,000
Moderate caries	62,000	31,000 to 95,000
Highly susceptible	56,000	41,000 to 84,000

A very large number of experiments are necessary to arrive at any definite conclusions as to the relative number of bacteria present.

Kirk (56) believes that immunity to caries is dependent upon the absence from saliva of the kind and amount of pabulum (absence or insufficiency of carbohydrate material) upon which the bacteria of decay normally thrive.

This brief review of the occurrence and action of some of the oral micro-organisms may serve to show how complicated is the problem of restricting the ravages of the hosts of organisms that inhabit the mouth. It indicates that further advances lie in the

direction of the discovery of the causes which lead to the attachment of bacteria upon the teeth and favor their development as well as in a detailed study of the individual oral organisms.

If it could be definitely established what forces are brought to bear in the production and maintenance of immunity, the problem of making decay a disease of rare occurrence would soon be solved. The problem is one of the greatest importance, as it has to do with the welfare and happiness of a great proportion of the human race.

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ORAL HYGIENE.

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ORAL Hygiene at present is receiving more attention **than** any other subject at the hands of the dental profession, and is gradually being accorded by the public its deserved place as a factor in public health. The history of the movement can be traced back to the efforts of a few men who belonged to the National Dental Association, and who had to work for the past ten years against great odds, both in that Association and with the laity. But although their work was tedious, many obstacles being met which were difficult to overcome, oral hygiene committees are now beginning to see clearly through the once dark clouds, and are encouraged by splendid results.

The boy of to-day will be the man of to-morrow, and if he is not taken care of in youth he will not be an able-bodied warrior, prepared to fight the battles of his generation.

The parents have first to be awakened to the fact that the mouth of the child will have to be set at ease, so as to properly perform its functions. To this end the teeth must be sound, the gums in a healthy condition, and the glands and ducts secreting normal fluids. If the oral cavity is not in such condition the stomach and alimentary canal can hardly be expected to perform their duties as nature intended. As Dr. Dowd very aptly says: "If the mouth is kept clean you will never know that you have an alimentary canal; if it is not kept clean you will never know that you have anything but an alimentary canal." Such being the case, the mind and physical condition will also be impaired, and where is the parent who does not want his child to grow up to be a robust man?

The community has undertaken to develop the minds of the children, but that the community shall perceive the relation between sound bodies and sound minds, the state should say to the parents: "The bodies of your children must be healthy—fit homes for good minds; they must be the starting-points for the self-respecting and efficient citizen of the future. If you can afford to put your child's body into that condition, you must do so. If you cannot afford it, the community will do it." It must be clearly shown that it is cheaper for the community to make the child

wholly well and to develop it into an efficient, economic unit, than it is to carry it through the school period as a retarded child, costing more than its fair share of expense, and to allow it to develop into the inefficient adult, with the necessary concomitants of hospitals, police supervision, courts and jails, at each step of which the unit is a direct charge on the efficient members of the community.

“Faulty physical conditions breed faulty physical habits, whether the individual is conscious of it or not. *It is not enough for us to correct the faulty conditions; it is our legitimate task to correct the faulty habits as well. Unless we correct the habits also, we cannot make the showing to which our cause is entitled.*”

The subject of Community Oral Hygiene in Toronto dates back to the fall of 1910, when the Toronto Dental Society received permission from the Board of Education to examine the children of two of the public schools. The results of that examination were given out at a banquet, at which members of the Board of Education, local Board of Health and Provincial Board of Health were present.

The result of the campaign was the appointment of a dental inspector to the medical staff of the Board of Education. At present it is the intention of the department to hold a civic clinic for the needy poor of the community. The details by which this will be accomplished have not been worked out at present, but time will soon put into working order a system which is sure to bring the good results of mouth health before the public in a remarkable way.

The organized committees of the profession have thus been accomplishing much, but as members of such we ought all to appreciate our individual responsibilities. The attitude of the profession will ultimately be judged by the attitude of its members. The individual dentist is perhaps the greatest factor in this campaign. Let us each resolve to do his duty.

From the summit of power men no longer turn their eyes upward, but begin to look about them.—Lowell.

ON THE ORIGIN AND SIGNIFICANCE OF SULFOCYANATE IN SALIVA.

*From the *Journal of the Allied Societies*, December, 1911.

BY WILLIAM J. GIES.

(From the Laboratory of Biological Chemistry of Columbia University, at the College of Physicians and Surgeons, New York.)

IN the three papers which immediately precede this one, we have presented the substance of our recent experimental work under the auspices of the Institute. Dr. Lothrop has given you an excellent summary of the general knowledge of oral micro-organisms in their possible relations to dental disease, and has stated the results of the experimental work which we had been hoping would be more immediately fruitful, but which we believe has prepared the way for material advances in the near future. We are planning to resume work actively in this particular connection in the near future. Messrs. Smith and Baker have successfully shown that variations in the occurrence and proportion of nitrite in given specimens of saliva may be influenced by oral micro-organisms, but that such variations cannot indicate anything definite regarding the condition of the teeth of the individuals concerned. The results that Mr. Baker and I have obtained in attempts to improve the method for the detection and quantitative determination of sulfocyanate, have removed certain mechanical possibilities from further consideration but have also emphasized the immediate need of conclusive work in this connection along collateral lines.

Although all the results to which I have just alluded are essentially negative in character, they are clarifying in their present effects, and stimulating in their influence for the future. They help, by their exclusions, to focus attention and activity upon more salient points.

The title of this communication, as it appears on the programme, may suggest that I am about to discuss positive rather than negative facts regarding salivary sulfocyanate, but in this connection, also, it is impossible to do more than call attention to wide gaps that exist in the general knowledge of this particular subject.

Sulfocyanate, in its possible relation to dental disease, has been discussed so frequently, and often so excitedly, that I hesitate to say that next to nothing is known by any one regarding the origin,

significance, function, or influence of sulfoeyanate in any part of the body, either in health or disease. I am trespassing on your time and patience to-night for the particular purpose of directing attention to a state of affairs which I believe has not been duly appreciated, but which I am sure you would wish to improve.

A careful survey of the many publications on this subject shows clearly that salivary sulfoeyanate has received merely superficial attention. The literature is saturated with guesses and theories. Dentists especially have based elaborate beliefs and particular methods of treatment on the shifting sands of assumption. We find that some dentists have been prescribing sulfoeyanate internally in comparatively large doses for the institution of immunity or of increased resistance to dental disease, without reporting or seeming to know or even caring anything about the pharmacology of the quantities of sulfoeyanate thus administered. Striking inhibitory influences upon plaque formation by oral micro-organisms have been attributed, seemingly without warrant, to homeopathic proportions of sulfoeyanate. Dental literature is flooded with words about sulfoeyanate, yet the paucity of biological facts regarding this substance is astonishing.

The present status of the published knowledge of salivary sulfoeyanate, and some of the most urgent needs in research on this subject, are summarized in a general way below:

The *origin* of salivary sulfoeyanate, and the causes of its quantitative *fluctuations*, have not been experimentally established. Current opinions on these matters are guesses for the most part. Elaborate experiments must be performed, on men and animals, before the essential facts can be learned.

The *significance* of sulfoeyanate in saliva cannot be fully determined before the origin of sulfoeyanate and the causes of its fluctuations are known. What the salivary sulfoeyanate signifies is at present hypothetical.

Salivary sulfoeyanate may represent *systemic* changes or it may result wholly from *local* activities in the salivary glands. Investigations of the origin and quantitative fluctuations of sulfoeyanate in the saliva and other parts of the body, which would include systemic and glandular experiments, might show clearly that sulfoeyanate is a general or glandular *excretory* product, or a substance of local (oral) *secretory* importance. The truth in these relations would end recurrent nonsense on this subject, and would afford new light and clear guidance to further discovery in this field.

That salivary sulfoeyanate bears a definite relation to the *condi-*

tion of the teeth—that it exerts inhibitory or antiseptic and preservative influences, or stimulating effects on oral micro-organisms—is believed by many earnest observers. These beliefs have not been based on or connected with studies of the origin of, or the reasons for the quantitative fluctuations in, salivary sulfocyanate.

Studies of the influence of sulfocyanate on the carious processes and on the associated oral and salivary products thus far have been fruitless.

Little or nothing is known of the pharmacology of sulfocyanate. This whole subject has apparently been ignored by the pharmacologists. One prominent writer (Kunkel: *Handbuch der Toxikologie*) goes so far as to say that the appearance of traces of sulfocyanate in the saliva is neither of physiological nor pharmacological significance, but he himself appears to know nothing about the subject from the experimental standpoint. One wonders why there is so much dogmatic writing of that kind.

If sulfocyanate exerts a beneficial action on the teeth, its administration, in suitable quantities, to persons suffering from dental caries should be followed by improvement of the condition of the teeth or at least by retardation of decay. Observers in the past have not agreed in their findings in such cases. It is desirable to determine in experiments on animals such as dogs, what influence, if any, is exerted by administered sulfocyanate on the *progress* of decay of the teeth into which cavities of different sizes and in various locations have been deliberately drilled. The progress of decay in natural extracted teeth (in different degrees of soundness) immersed in media containing sulfocyanate should also be determined.

Our knowledge regarding the effects of sulfocyanate on individual oral micro-organisms is uncertain and conflicting. This state of affairs seems to be due primarily to the fact that the work in this connection has been even more desultory and fragmentary than that in certain other connections already mentioned.

That sulfocyanate exerts a material influence on plaque formation has been repeatedly affirmed and as frequently denied. Perhaps these contradictions are due to the fact that there is no agreement upon either the cause of plaque formation or on the essential characters of plaques themselves. This particular portion of the field needs thorough investigation from new viewpoints.

It has recently been claimed, apparently with justification, that the methods of determining the presence and the quantity of sulfocyanate are therefore probably open to question. Satisfactory



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methods must be immediately devised in this connection in order that further study may be conducted with accuracy.

The possible influence of sulfocyanate as an erosive agent, or as an inhibitor of erosion, has not been determined. The possible effects of salivary sulfocyanate on the gums need attention.

Much has been learned regarding salivary sulfocyanate, but little that is definite has any bearing on the important problem of dental caries. New researches, free from bias in every direction, are urgently needed in this field.

SINGLE VERSUS FREQUENT TREATMENT PRIOR TO FILLING ROOT CANALS*

BY J. H. GASKILL, D.D.S., PHILADELPHIA, PA.

THE subject of root canal filling is one that is as old almost as dentistry itself. It has been written upon and spoken about as much if not more than any other dental operation. But in spite of the large amount of literature there are still differences of opinion and troubles which make the roots of teeth the bugbear of so many practitioners.

Many operators hesitate to destroy pulps when there is an exposure, or when the crown is so badly destroyed that an artificial substitute is necessary, and for cosmetic reasons an all-gold crown is not desirable, or when a bridge is to be used and the abutments cannot be properly shaped to get the best results; is it not because of the dislike of the amount of work involved in treatment and fear of future trouble? I think so.

This subject I will have to treat more or less empirically; from lack of time and I might also say ability and apparatus I have not been able to give the scientific study which it deserves. The single treatment and immediate filling of root canals is not a difficult problem and is something which has been practiced for years, but it is not as universal as it should be.

First I will take the teeth from which the pulp has been extracted uninfected; by this is meant vital pulps extracted while anesthetized under pressure. I say uninfected, because this operation should be done so carefully and thoroughly that there is no infection of the pulp or root canal. In all this work it is absolutely necessary that the rubber dam be applied, otherwise there is danger from the saliva.

The instruments used require our attention; some operators advocate sterilizing by boiling, even going to the extent of having a lot of broaches boiled and while still hot brought in a napkin by the assistant, and using the broach only once until it is again boiled. Now I do not discount the value of thorough sterilization, but the method I do criticize. My plan at all time, until the root

*Read before the Academy of Stomatology at a stated meeting held Tuesday, March 28th, 1911, the Vice-President, Dr. Otto Inglis, in the chair, reprinted in Oral Health from the *Dental Brief*.

is ready to fill, is to have my broaches saturated with the antiseptic, then you may be sure there cannot be infection from the instruments.

For the extirpation of live pulps, I use pure carbolic acid, for these reasons: it is a good anesthetic, an antiseptic, and a coagulant, in that it acts as a styptic. Where cocain with alcohol is used, there is nearly always a profuse hemorrhage; used in conjunction with adrenalin chlorid, while at the time of the operation there may not be much bleeding, there is apt to be a secondary hemorrhage, which will cause peridental inflammation with the accompanying soreness of the tooth; but with carbolic acid we have seldom much bleeding, and if there is any it is easily stopped.

The antiseptic properties of carbolic acid makes it one of the best remedies which can be used for this operation; after the pulp is anesthetized I take a fine Downie broach, wrap a few fibres of cotton on it and dip in carbolic acid, then pass it slowly up into the canal; by this means I have gotten the antiseptic in the canal before the pulp is removed; it toughens the pulp so that it usually will come out as a whole, and at the same time by going slowly if there is still some sensation, will complete the anesthesia. After the pulp has all been removed, the canal is again treated with carbolic acid, at all times having the broach wet with the medicament; then when the canal has been enlarged, dry it out thoroughly with an electric dryer, or if you do not have one the chip blower will do; after the canal is dry moisten with oil of eucalyptus, this will act as a solvent for the gutta percha; pack into the canal gutta percha until the root is two-thirds full, fill the balance with oxychloride of zinc. This usually takes about all the time I want to give for one sitting, so the patient is dismissed and the cavity filled or other operation completed at a later date.

For canals with putrescent pulps the rubber dam should be applied; before attempting to open into the pulp chamber, wipe out the cavity with some antiseptic, I use beechwood creosote; then carefully open the pulp chamber in a way that will not force anything through the canal and so cause an infection of the dental membranes. After the tooth has been so opened that free access can be had to the canal, take a fine broach, dip in creosote and pass carefully into the canal and remove as much as possible of the pulp; do this until all putrescent tissue is removed, being careful to have your broaches wet at all times with the creosote, and keeping the canal wet with it also, then enlarge the canal, and for this purpose I use the Downie broach of various sizes, they being less apt to act as a piston and so force something through the apical foramen; after the canal has been enlarged, dry well, using absolute alcohol

and hot air, then treat again with creosote; by this process the dental tubuli will be made sterile, the alcohol and hot air drying them out so that the creosote can enter and destroy all micro-organisms. This had better be done several times to insure the death of all bacteria.

In multirooted teeth it will sometimes be found that there is a putrescent pulp in one root while it is vital in others; in these cases treat and fill the putrescent one first and then if one wants to take the time at that sitting, go to the other roots using the method for uninfected vital pulps.

In cases of a tooth with an alveolar abscess, if there is a fistula and free passage can be gotten through the root to the opening in the gum, and carbolic acid can be forced through, I do not hesitate to so treat it, and then treat and fill the root as for a putrescent pulp, feeling that all has been done that can be, to bring about healing.

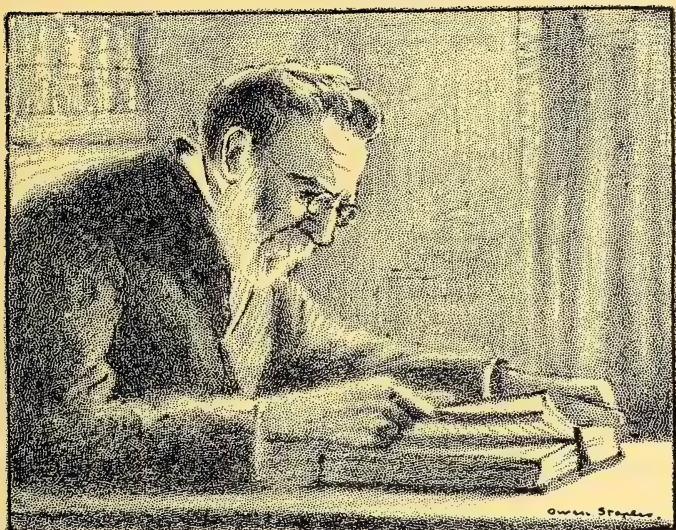
What causes an abscess? It is the products of putrefaction infecting the tissues outside of the root; if this source of infection is obliterated, the root and pus tract made sterile and the canal filled with an inert substance, and each step of the operation has been thorough, nature will do the rest. All the treatment in the world cannot do more.

You may ask, should there be a denuding of the end of the root, what then? Here a surgical operation is necessary, that is, excision of the apex of the root; but before results can be expected from that, the root must be filled to render it harmless.

To be continued in our next issue.—EDITOR.

AN optimist is a fellow who will sit up all night to make lemonade out of the lemons handed him through the day.—W. E. Mason.

A QUIET life often makes itself felt in better ways than one that the world sees and applauds; and some of the noblest are never known till they end, leaving a void in many hearts.—Louisa M. Alcott.



THE LATE DR. WM. BRODIE.

Dental Surgeon and Provincial Entomologist.

THE above is a reproduction of the life-sized oil painting prepared by Owen T. Staples, upon instructions from the Brodie Memorial Committee.

The above cut was made from a pencil sketch drawn for ORAL HEALTH by the artist and reproduced here that the entire profession might see the excellent results of Mr. Staples effort.

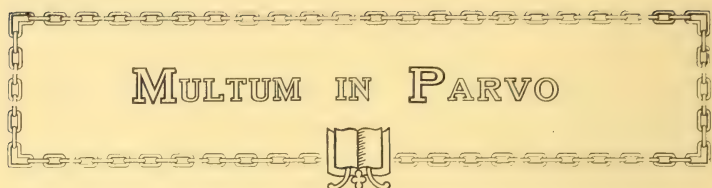
Subscriptions to the Fund, received up to January 15th, 1912, are as follows:

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Dr. Magee, St. John	2 00
Dr. Eaton, Toronto	2 00
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MULTUM IN PARVO

This Department is Edited by C. A. KENNEDY, D.D.S.

Librarian Royal College of Dental Surgeons.

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

Address. C. A. KENNEDY, D.D.S., 2 College Street, Toronto.

PRESERVING THE SHARPNESS OF BURS IN STERILIZING.—In order to preserve the sharpness of the cutting edge of burs in sterilizing, the burs should never be boiled, as boiling dulls them. If they are claned by simply brushing them with soap—tincture of green soap being preferred—and water, dipped in boiling water, and placed in a receptacle containing alcohol, they are sufficiently sterilized for use. Since the instruments used in delicate eye operations are sterilized in this manner, it seems that this procedure is applicable in dental burs.—A. W. Book, *Odontologist*.

DO NOT USE A PORTE SCREW.—The use of the porte screw for extracting putrescent roots should be discouraged. It forces the infectious contents of the root into the soft tissues at the apex.—V. B. Newell, *Dental Review*.

INDICATIONS FOR PLASTER OF PARIS.—Three classes of cases present, however, where this material is positively indicated for taking impressions: First, where any of the natural teeth are present. Second, where there are undercut surfaces, opposed to each other. Third, where the ridge is flabby, and will be readily distorted or bent out of shape. In all other cases a modeling compound that becomes plastic at very low temperature and hardens quickly can be used to best advantage.—J. H. Prothero, *Dental Review*.

TO REMOVE MELOTT'S METAL FROM GOLD.—Place in nitric acid, full strength, for about four hours.

REMOVING IODINE STAINS.—Alcohol removes iodine stains from the hands or office linen. If applied early, the entire stained surface can be whitened, no matter how extensive the stain.—G. A. Wilson, Jan. Allied Societies.

IN INSERTING CEMENT INTO A CAVITY, after the cement is placed, by dipping the instrument in the dry powder remaining on the slab, it may be packed, without adhering to the instrument.—*The Hya-Yaka, R.C.D.S.*

BACTERIA OF THE MOUTH, AND THE VALUE OF TOOTH-BRUSHES AND TOOTH-PASTE.—On waking in the morning, the mouth has been found to contain about 3,000 million bacteria capable of being removed by a fivefold rinsing with 25 cc.m. of water each time. After ordinary washing of the teeth with a hard tooth-brush, about one-fourth the number could still be rinsed away. After using, on another occasion, a tooth-paste containing one of the germicidal essential oils which have a very highly phenol coefficient, 120 million only were left.—E. C. Bansfield (*Lancet*), *Cosmos*.

HOW TO MAKE AN UPPER DENTURE STICK.—Cut agroove clear across the model about 1-32 of an inch deep, and from 1-8 to 1-4 inch from the rear end of the denture; this makes a little raise on the denture, and may cause some irritation, but you know how to remedy that.—J. W. Cormany, *Dental Review*.

HEAVY DENTURES ON THE LOWER JAW.—On the flat, narrow lower jaws the heavy cast-metal plate is inadmissible, for the reason there is nothing to hold it in place. My own experience has demonstrated this in an emphatic manner, as I probably would never have learned so satisfactorily otherwise. I have for many years inserted these cast-metal dentures. After the loss of the balance of my lower teeth I made myself a set. It felt comfortable, but after a few hours, as I leaned forward to speak to a student, it at once slipped forward, as the lip would not sustain the weight. I ate my supper with it, but, on retiring, as I lay down, it slid to my cheek. I had no further use for the heavy denture. Of course, on a fair ridge, this would be obviated; but in my experience, the jaw with a ridge, after the teeth have been out a number of years, is a rarity. But I have learned this, also: that weight is not needed on the lower jaw, for the rubber is just as useful; in fact, on the lower jaw rubber is as good as anything for full or partial dentures.—L. P. Haskell, *Chicago Dental Brief*.

CONSEQUENCES OF RECKLESS EXTRACTION OF FIRST MOLARS.—Some of the disastrous consequences of ill-advised extractions of the first molars are these: A tipping of the second molar, abnormal stress of occlusion on the distal cusps of the second molars, causing a pressure which forces the mandible backward; a lack of growth in the mandible; a dropping back of the other teeth, and excessive overbite.—W. Johnston, *Dental Digest*.

METHOD OF MAKING A PORCELAIN CROWN FIT PERFECTLY.—pin, and the crown forced to place on the root, with the wax between the root and the crown. All excess wax is carefully trimmed off; wax and pin are removed together, and gold is cast to the pin. The crown is cemented to the pin, and after the cement is hard the gold is trimmed and polished, when it is ready to be set.—*F. B. Johnson—Dental Summary.*

GETTING THINGS DONE.—Getting things done is a matter of getting things started. Nothing is done that is not begun—be it good or bad.

CARVING CUSPS FOR SWAGED GOLD SHELL CROWNS.—The band is made, and filled with moldine. The cusps are then carved with a wax spatula, and dusted with lycopodium powder. An impression of the cusps is taken in dental lac, and 32-gauge gold plate is swaged into the impression by the use of some cusp swager. The cusps are then trimmed and filled with solder.—*C. H. Chamberlain, Dental Summary.*

EARNING, MAKING AND GETTING MONEY.—There is quite a difference between earning money, making money and getting money. The first may be called honesty, the second speculation, and the third, robbery.—*Practical Engineer, from System.*

WASTE.—Waste is the canker worm that makes many a bank account hollow. It is a germ of misfortune, the ban of many a promising career, the boon companion of want. While we may not be able to stop it, we should keep well within bounds.

MAKING THE WORLD BETTER.—Make yourself an honest man and then you may be sure that there is one less rascal in the world.—*Carlyle.*

A MASTER KEY.—A bright smile, a beaming countenance, a playful word—these find an entrance into the closed heart and raise the downcast eye, and bless him that gives and him that takes.—*Dean Stanley.*

THINKING.—Thinking is the least exercised privilege of civilized humanity.

START-FINISH.—It is easy to start, but to keep going so as to make a satisfactory finish—that is the rub that tests one's metal.

CAPACITY AND POWER.—Don't forget that responsibility walks hand-in-hand with capacity and power.

The confirmed nagger and the chronic kicker never know they are such. They consider themselves kindly advisors and beneficial critics, unappreciated and misunderstood.



Winnipeg, Man., Jan. 20, 1912.

Dear Mr. Editor:—

In the last issue of ORAL HEALTH you suggest that the Burlington Convention Committee would be glad to get ideas from the profession as to what the programme should comprise.

I would suggest that the Programme Committee provide an evening for "class reunions."

If it were known that graduates would meet in groups according to graduation year, many men would attend the Convention for the sake of renewing old friendships, and undoubtedly many happy reminiscences would be indulged in.

Needless to say, I am going to the Convention, class unions or no!

Heartiest congratulations on increased size and value of ORAL HEALTH. I enclose the wherewithal for 1912 subscription.

If you think the above suggestion of any value, you may use it, but don't publish my name.

Fraternally,

.....

P. S.—Also, have lots of the preventive side of dentistry on the programme, and plenty of time to discuss ways and means for the education of the public and profession in oral hygiene. I'll meet you at Burlington.

January 20th, 1912.

Dear Mr. Editor:

Personally, I would like to see the following three subjects provided for in the Canadian Dental Association Convention Programme, viz.: "The Need For a Dental Lecturer in Medical Colleges," "The Dental Surgeon in the Army," "The Requirements of the Dominion Dental Council."

The committee ought to name members of the profession to present reports on these subjects to the meeting so that they may be intelligently discussed.

A Nova Scotian.

ORAL HEALTH.

EDITOR — — WALLACE SECCOMBE, D.D.S., TORONTO, ONT.

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Vol. 2 TORONTO, FEBRUARY, 1912. NO. 2

EDITORIAL

MISREPRESENTATION OF THE DENTAL PROFESSION.

BEARING the name of the Temple-Pattison Co. as "publishers," the January issue of *Oral Hygiene*, a journal published in Pittsburg by Lee Smith & Son, has been sent to the dental profession in Canada.

The Temple-Pattison Co. in their personal message to Canadian dentists, headed "Some Straight Talk From the Publisher," outline a conception of the campaign of dental education that would prove a death-blow to the cause, and is an insult to every Canadian dentist.

In part this "Straight Talk" is as follows:

"In our capacity of dealers in dental goods we are naturally interested in any movement that *promises to be of benefit to our customers.*

"If the wide publicity we shall give this subject, by sending a copy of the magazine each month to every dentist in our territory, benefits humanity and at the same time *creates a demand for more dental work*, it will be no more far-reaching than we anticipate.

"If an increased demand for dental work means an increase of business for us . . . we shall have amply earned any degree of prosperity that may develop.

"We have felt the need of a magazine of this kind ever since we have been in business."

The Temple-Pattison Co., by their own statement, are in the oral hygiene campaign for what they can get out of it financially. Not content with prostituting the movement with the view to their own financial gain they do not hesitate to state that "*it is of greater importance to you as a dentist than to anyone else outside of those who will be benefited in a physical sense,*" because "*it creates a demand for more dental work.*"

Educational Committees, working for the advancement of the cause of mouth health, have already had to face the sneer of thoughtless individuals, but it has remained for the Temple-Pattison Co. to go to "tremendous expense" to publish and scatter broadcast an outrageous and false statement of the end hoped for in the educational campaign. Such a statement maligns the dental profession and negatives the work of every educational committee in the country. These committees are at work because they believe most of the dental ills of the present can be prevented, and that "Preventive Dentistry" is the thing of the future, when dental practice will consist more and more of prophylactic measures.

We believe the dental profession will very strongly resent this "Straight Talk From the Publisher." The "Publisher" is out-reaching himself when he enters the oral hygiene campaign with the avowed purpose of the Temple-Pattison Co. The attempt in this "Straight Talk" to harmonize an altruistic interest in oral hygiene, with the repeatedly expressed hope, of selling more dental supplies to replace lost tooth tissue is incongruous. The oral hygiene campaign has as one of its objects the selling of more tooth brushes and less dental supplies.

The Temple-Pattison Co. "have felt the need of a magazine of this kind ever since they have been in business. What kind? Not one devoted to "Oral Health" apparently, unless this magazine has escaped the notice of the Temple-Pattison Co. What kind then? An advertising proposition for the Temple Pattison Co. with enough oral hygiene to carry the ads, foisted on the dental profession as a "Journal For Dentists."

How much longer do the profession intend to permit their society literature and even their efforts toward the betterment of public health, to be controlled by the dealer in dental supplies? Are they satisfied to have their ideals in the campaign for mouth health warped and twisted to fall in line with the advertising scheme of a dental supply house?

Such a proceeding is entirely out of harmony with the dignity of the dental profession. There are plenty of legitimate channels by which the supply house may reach the profession with adver-

tising material. We wish to most emphatically take the stand that the supply house must reach the profession (if it wishes) through the professional literature or by means of straight advertising and not as the Temple-Pattison Co. would have it—have the professional literature reach the dentist through the advertising booklet of a supply house.

The Temple-Pattison Co. has made a grave mistake in trying to force its way into the Canadian educational campaign, for advertising purposes. The profession is quite capable of handling this campaign and will repudiate this brazen attempt to commercialize a movement originated and carried on entirely with a view to reducing the neglect of care for the teeth, that leads to the present prevalence of caries and associated diseases.

The Temple-Pattison Co. have not only attempted to commercialize the movement, but have entirely misrepresented its object. By their ill-advised move they have precipitated the whole question of the relation of supply houses to dental literature. This question has been dealt with by the Allied Societies of Boston and New York. These societies publish their own journal and make no secret of the fact that they believe it better for a dental magazine to have no trade alliances that might be apt to compromise.

In the next issue of ORAL HEALTH we propose to give the dental profession a few further facts in relation to this question.

A FEDERAL DEPARTMENT OF HEALTH.

It has been reported that the Dominion Government is considering the establishment of a Department of Health.

During the year 1911, 1,744 children in Toronto Public Schools had their teeth put in good condition, according to the records of the Department of Medical Inspection.

In Germany each school child must bring a certificate from the family dentist or Municipal Dental Dispensary at the beginning of the school term, to the effect that its teeth are in good condition.

DENTAL INSPECTION OF RURAL SCHOOLS.

ONE of the problems engaging the attention of those interested in dental inspection of school children is that of inspection in rural schools. City schools will be provided for, but what of those in the rural districts? Obviously a Dental Inspector for these schools is out of the question. The only possible means of inspection is through the teacher, and just here it may be said that any system of inspection of school children that does not include the teacher as an "inspector" is fundamentally wrong.

The teaching profession is that of child development. Hitherto, it is true, efforts have been practically entirely directed toward mental development regardless of the fact that thousands of school children are engaged in a vain struggle against physical handicaps. There is beginning, however, at present a great public awakening to the folly of these conditions. The teacher must more and more become the guardian of the physical welfare of the children under her control, and the time spent in this effort will be doubly gained in the increased mental efficiency that comes with the removal of physical defects.

As far as dental conditions are concerned an intelligent teacher may readily learn the evil effects of unhealthy mouths and also something of the proper care of the teeth. If she can be the means of spreading this knowledge among the parents, adopts the rule in her class of "a mouth as clean as the face," and each morning is as particular that her pupils' mouths are clean as she now is that their outward appearance is satisfactory, 50 per cent. of dental defects at least can be easily avoided, and the general health and mental efficiency of her class revolutionized.

Some steps should be taken by the Government to train teachers that they may guard the physical welfare of the children under their care, where a school, medical, dental and nursing staff is not available and that they may assist this staff when present, particularly in teaching personal hygiene and in adopting rules of health as part of the class routine.

DR. F. J. CONBOY has been elected Chairman of the Board of Education, Toronto. This honor was conferred upon him unanimously by his fellow members after three years of faithful and intelligent service on the Board. The office is one of great responsibility, as well as honor. Dr. Conboy has the congratulations and good wishes of ORAL HEALTH.

THE ONTARIO DENTAL SOCIETY AND THE CANADIAN ORAL PROPHYLACTIC ASSOCIATION, LIMITED.

“Dr. Webster: No; I am sorry there is so much misunderstanding.

“The question was again called for.

“The President put Dr. McDonagh’s amendment, which, on a vote having been taken, was declared lost.

“The President then put the motion to adopt the report, which, on a vote having been taken, was declared carried.”

THE above is a reproduction of that part of the official type-written report of the last meeting of the Ontario Dental Society, covering the Society’s action in relation to the Canadian Oral Prophylactic Association, Limited. The printed report of the proceedings stops at the point indicated by the arrow. Thus the profession is left entirely in the dark as to what action the O. D. S. took in this important matter.

The vote recorded above was taken on an amendment to the motion to adopt the report of the Ontario Educational Committee. The amendment suggested that, instead of the Committee being elected by the Society, as heretofore, it be composed of representatives from (a) the Society, (b) the Board, and (c) the Canadian Oral Prophylactic Association, Limited. The Society took the only logical course—defeated the amendment, and declared in favor of electing its own committee without help from an outside body, over whose representatives the profession could have no possible control.

It would be a bad thing for the dental profession to be tied up to the Canadian Oral Prophylactic Association.

It would be fundamentally wrong for the dental profession to engage in the manufacture of tooth-cleansing preparations. It would be equally wrong for the dental profession to do the same through a subsidiary company. The dental profession must make it abundantly clear to the public that there is absolutely no connection between any company making and selling tooth-paste and the profession itself. The C. O. P. A. feels sorry that the O. D. S. cannot understand the question. The O. D. S. does understand the question, and took the only course open in politely telling the C. O. P. A. that the profession preferred to elect its own committee to manage its dental educational affairs and to make no alliance with any company.

When the dental profession recommends a dentifrice it must *not* be because it is a philanthropy, *but because it is the best dentifrice*. Men who claim to have made scientific tests declare that Hutax is positively injurious, and contains useless and harmful ingredients. This may or may not be true. In any case, why should the dental profession open its mouth, shut its eyes and take the dose?

The days of blind thoughtlessness in dentistry are past. The dentist of to-day "wants to be shown." He wants a dentifrice that is scientifically prepared by men who have studied these questions and have expert knowledge concerning them.

The question of an ideal dentifrice has been occupying the minds of wide-awake practitioners, and can only be answered by men who have given the matter scientific treatment, and who can speak upon such matters with authority.

* * * * *

Without entering into the question of the possible need, five years ago, for the formation of the Canadian Oral Prophylactic Association or of the work it has since undertaken, ORAL HEALTH takes the position that it is quite inimical to the best interests of the dental profession for the profession to become in any way associated with the C. O. P. A., or to enter into any "entangling alliances" with it.

Let the C. O. P. A. work out its own salvation quite independent of the profession. If Hutax preparations are the best, their merit will sell them. They will not need to curry favor on the ground of their possible aid to charity.

If Hutax preparations are the best, the profession will recommend them because they are the best, and not because a small royalty will be paid to the shareholders of the C. O. P. A. to spend in philanthropic and charitable work.

Friendship, Fraternity, or Philanthropy, severally or collectively, should not influence the dentist in his choice of a dentifrice. Merit is the only factor that ought to count.

Manufacturers are glad to send samples of powders and pastes. Try these products *yourself*. Try them all. Study and think about the matter. Experiment. Most all the manufacturers supply the list of ingredients. They do not give you the working formula, nor should you expect it.

In short, prepare yourself to come to an intelligent personal judgment on this dentifrice question.

THE QUESTION OF A "PUBLICATION COMMITTEE."

IN the last issue of ORAL HEALTH attention was drawn to the need of the appointment of a Press and Publication Committee in connection with Canadian Dental Conventions.

The printed proceedings of the last meeting of the Ontario Dental Society have since come to hand and but go to show the great need for such a committee.

The introduction to the printed report refers to a "Committee on Publication," but this a mere inadvertence. Enquiry has elicited the information that no such committee is in existence.

The need for a real Publication Committee is shown in the report of the discussions of the convention and in at least two important executive matters that were omitted entirely.

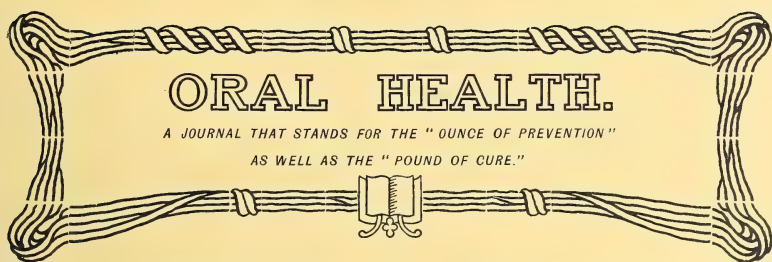
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In the published proceedings, over twelve pages are taken up with the Report of the Educational Committee of the Society, a discussion of the report and the discussion on the question of changing the composition of the Ontario Committee by giving the Canadian Oral Prophylactic Association, Limited, and others, representation upon the Educational Committee of the O. D. S. The printed report gives absolutely no record of the action of the Society in relation to that matter. Surely, if the subject was of sufficient importance to be given over twelve printed pages, it was of sufficient importance to record the will of the society in relation to it. The stenographic report gives the judgment of the society complete. The printed report stops short at the completion of the discussion, and omits entirely the vote of the Convention. In view of this omission, ORAL HEALTH discusses in this issue the facts involved and the decision of the Convention in relation to the composition of the Educational Committee.

ATENTION is directed to the article by Miss Rogers, Superintendent of School Nurses, Toronto, appearing in this issue. Miss Roger's rare experience and ability make this article of special interest, particularly to those looking for some practical step toward the betterment of the health of school children.

If you would be a true friend,
don't tell a man what he
would *like* to hear but
what he *ought* to
hear.





Vol. 2

TORONTO, MARCH, 1912.

No. 3.

THE STORY OF TIM.

BY W. W. BELCHER, D.D.S.

Adapted by courtesy of the Author.

CHAPTER I.

HE was christened Timothy, but the kind-hearted neighbors soon abbreviated this to "Timmie," and later it was "Tim," and this seemed to please everyone, including his fond parents, who lived on the "Avenue," very close to a big bake shop, where one could get the benefit of all the delightful odors that came from the ovens.

Tim was the third baby, but the only one living. Those who came before had succumbed to unsanitary milk and a trying second summer with teething ills and other incidents to unsanitary surroundings.

His mother was very fond of him, and so too were the neighbors who called and were very free with their advice, but Tim's mother had learned by sad experience that crackers or cold potatoes were not the best food for a newly arrived baby and procured his milk at a nearby station and was reasonably careful in sterilizing his nursing bottles.

Tim was such a fat and rosey baby and weighed just ten pounds when he first came into the world. The immediate business of this little specimen of humanity seemed to be in the eating line. His parents were both healthy, and little Tim soon developed an appetite that would have done credit to a hired man, and paid strict

attention to his job of putting on flesh; for Tim had a big contract, he must double his weight within a year; if he failed in this he would join his predecessors with a "gone before sign" and his name in the big family Bible.

Suppose that a healthy man, weighing 150 pounds, were told that he must double his weight within a year, don't you suppose he would commence to store away the necessary food for such a problem?

And Tim *was* busy; he was ever at the lunch counter and seemed to be little more than an animated mouth with a stomach and digestive system. He nursed from the bottle, went to sleep and awoke with a cry couched in one word; like unto "Oliver," he was always asking for more.

CHAPTER II.

His being, for good or evil, was determined by his weight, and the family scales became almost a shrine to the anxious parents.

Once having doubled his weight, he must do it all over again, and, having successfully passed that trying period, the second summer, with its teething terrors, he has, after a time, twenty good, sound teeth to help him double his weight again. He has long since graduated from the lunch counter, and now sits at the family table and takes his meals, fortified between times with cookies, milk, bread and molasses and other delicacies of childhood.

At 5 years of age he weighs 50 pounds and enters the kindergarten. Now is the time when he needs those twenty teeth, needs them badly, as he must not only go on developing in weight, but also provide for his mental equipment as well. His mother has been careless in not taking care of his baby teeth, and he does not know that they should be kept clean and brushed at least twice daily; they have been allowed to decay, and he is seriously handicapped in the struggle for existence.

He ceases to put on weight. How can he gain? His teeth are decayed; they ache and keep him awake, are painful to use, and he hates to chew on them, so lives on soups and mushes. The decayed teeth cause abscesses or "gum-boils," and slimy yellow pus or matter is thrown off and contaminates every mouthful of food he swallows.

Over twenty varieties of harmful germs have been found in the human mouth. Tim doesn't have them all, but he has a sufficient number to keep him miserable. The pus secreted not only contami-

nates his food, but alters his gastric juices and makes them useless for the purpose for which they were intended. He becomes puny; his vitality is lowered, and while a body in health can consume a great number of harmful germs, Tim, with his lowered physical condition, is a prey to them all, and has one thing after another.

CHAPTER III.

A clean mouth is a safeguard against disease. "A clean mouth turneth away trouble" is as good a proverb as "A soft answer turneth away wrath."

Tim's poor little mouth has been neglected and he has a dozen or more cavities in as many teeth. His tonsils are swollen and enlarged. As one of the results of a dirty mouth, adenoids make their appearance. They are a growth in the back of the throat, and he finds it impossible to breathe through his nose and must of necessity keep his mouth open to breathe; his blood is impoverished, he is not getting his supply of oxygen to keep it pure, and it is further contaminated with every breath he inhales through his unclean mouth.

At this trying period he has that most dreadful of childish diseases, diphtheria; with a mouth diseased, enlarged tonsils, adenoids and a lowered physical condition and no teeth worthy of the name, his chances of recovery are one in a hundred. He is hurried to the hospital and, thanks to a strong constitution he has inherited, he manages to pull through. For a long time he is little better than an invalid. The neighbors shake their heads and talk about country air and nourishing food; it never occurs to them to look at Tim's teeth and mouth as a cause of his troubles.

His natural defences are weakened and his hearing becomes impaired, as the result of the adenoid growths shutting off the supply of air to the ear passages; the faulty digestion reflects on the sensory nerves and his eyesight is impaired. He becomes peevish, cross; fights his playmates and is a general nuisance to himself and the family, who despair of ever rearing him.

Tim's parents do not know that these adenoid growths can be removed by a comparatively simple operation and his face soon takes on an idiotic stare, with mouth continually open. Did you ever try breathing through your mouth for ten minutes? Try it and see how Tim was suffering. His nose, intended to warm the air and prepare it for the delicate structure of the lungs, becomes a useless ornament. The nose has a still more important function, it is meant to screen the dust and catch the germs contained in the air so they shall not enter the lungs. He is without this natural defense also.

Ninety per cent. of the diseases flesh is heir to are introduced through the mouth and he is lacking in any defense through his disregard of the simple rules of Mouth Hygiene.

CHAPTER IV.

As a result of his inability to chew, Tim loses the use of his muscles of mastication and his jaws cease to develop and grow. When his permanent teeth appear they find a baby jaw and no room for a man's teeth and crowd themselves in as well as they can. The baby teeth being decayed, the roots are not absorbed and they are allowed to remain or are painfully removed; they make a bad condition worse by taking up the space intended for their betters and the incoming teeth are irregular and add to the evil appearance of Tim's face. If his parents had the money his teeth could be regulated and the jaw developed, but they are too poor, and besides do not know this, and his face is very unpleasant to look upon.

Tim's mother is very careful that his food shall be prepared in a cleanly manner, the kitchen utensils are bright and shining. The dishes from which he partakes his meals are sure to be clean and thoroughly washed before each meal.

But to what purpose? This food must pass through a mouth so unclean that it contaminates everything passing through it.

He has been taught to wash his hands and bathe his body, but his mouth, the very vestibule of life, has been left wholly without care. His poor little mouth has been neglected until it looks like a burnt district and is repulsive in the extreme. To his mother, Tim's mouth was a sealed cavity, and she never thought of examining it until disease manifested itself in aching teeth, and this was accepted as a disease to be suffered until such time as nature replaced the decayed teeth with a second set, or in the case of the second set to be replaced by the dentist with an artificial substitute.

CHAPTER V.

Tim had a diseased mouth, and "colds" were his special trouble. With every cough, with every sneeze, he sends out numberless droplets containing great numbers of germs; with every exhalation he contaminates his fellows. No child should be allowed to scatter the results of physical neglect in this manner.

But Tim was not conscious of spreading disease. His was only

one of many unclean and uncared for mouths, any one of which was sufficient to contaminate the atmosphere of a whole school room. He passed his burden of microbes around impartially. The uncared for child of the poor, with aching and diseased teeth, bears the pain, but all his associates, including the carefully guarded child of the rich, with ideal home surroundings, must share in the infection brought about by this neglect.

Poor Tim, poisoned with the exuding pus from his defective teeth, and the functions of nutrition interfered with, unable to chew his food, is soon left behind in his studies, and figures in the backward class in school. He becomes discouraged; he loses faith in himself and he looks with envy on those more favored.

His companions shun him and he has no place in their childish sports. He plays "hookey," innocently at first, but soon without the innocent features, and this is the first step in a life of crime.

Whipped and misunderstood at home, apologized for at school, with a reputation for a bad temper, for being obstinate and dull, when the whole trouble was that he had to fight a diseased condition produced by a deficient and uncared for dental equipment; with the poisoned and contaminated and poorly chewed food that refused to build healthy tissues and brain matter, Tim, little by little, day by day, year by year, suffering at first from mental incapacity, he finds congenial company and becomes a physical and moral degenerate.

CHAPTER VI.

Do you think this picture has been overdrawn? Tim is only a type, it is true, but how many children whom you know have entered school full of promise and from some unknown cause have slowly drifted from bad to worse, lost their places and degenerated into physical and mental unfit?

Dr. Gulick, after some time investigating this matter, says that two defective teeth in the mouth of a child will retard him for half a year and adenoids will keep a child back a year.

What are we doing for children like Tim in this land of ours? Don't you think that he has a right to have his mouth placed in condition? If his parents cannot afford to have it done, then the State should step in and insist that the conditions should be corrected. "For the child not charity, but Justice."

It takes about seven years for a girl or boy to go through the

public schools. A child starts at five, at twelve or thirteen should be graduated, and the cost is figured at so much per capita.

Every time a scholar fails in his school work and is left behind it takes just so much longer and adds materially to the school tax. It has been estimated that this entails an extra expense of between three and four million dollars in the school work of New York City each year. Some of this is due to defective mentality, but 90 per cent. is from defective physical condition. A very large proportion of these physical defects are dental. In one school, of 308 who were physically defective, 267 had bad teeth. Furthermore 75 to 98 per cent. of our school children are suffering from defective teeth; these figures are not guesswork, but have been carefully compiled from every country in the world.

What are we doing to combat this evil in the public schools? In most places nothing! We have plenty of money to fight poodle bugs, foot and mouth disease among our cattle and infectious disease among hogs, but how much to preserve the teeth of our children?

In 148 cities of the United States during the year 1907, the ratio for health department expenses to the total government expenses were 1 8-10, the ratio for fire and police in these same cities was 23 per cent. Greater New York spent \$8,000,000 on her fire department with a fire loss of \$9,400,000. For the public health department \$2,418,499. The value of life lost from preventable diseases in New York City yearly, using Professor Fischer's estimate of \$1,700 as the producing value, was \$56,550,000.

Question—Would it not be an economy to spend less money on our cattle and hogs and more on our greatest national asset, the boys and girls of to-day, who are soon to be our rulers and law-givers.

CHAPTER VII.

If Tim had lived in Germany, he would have been compelled to keep his mouth clean, not only for his own good, but for his fellow students. Germany is a country where they are not only very much concerned about the health of their cattle and hogs, but have the intelligence to look after their school children as well.

It was only after the startling nature of the school children's need of dental services were presented to her that, after mature deliberation, the work was undertaken and first established in the City of Straasburg, where they have recently erected a \$60,000 building for the school dispensary. All school children's teeth are

examined twice yearly, and those too poor to pay are treated without recompense, and the municipality pays for the services rendered. This action has been followed by other cities, and at the present time over forty have Dental Dispensaries connected with their school system.

Switzerland, Russia and other continental countries have followed her example, and in the City of St. Petersburg, Russia, are *nine* such institutions for her worthy school children.

Germany, having established this espionage was the first to discover a great truth—it really paid in dollars and cents to take care of her school children's teeth.

The work has been in operation for a sufficient length of time to demonstrate:—

First—That the time expended in putting the teeth in order was far less than the time formerly lost in toothache and disability caused by diseased teeth.

Second—That the cost of keeping the teeth in order was more than compensated for by better health and consequent reduction in medical expenses.

Third—That the child became physically stronger, secured a higher average in his studies, was easier to control and was apparently happier.

In foreign countries, the caring for the weaker members is taken as a matter of course. This is especially true in the case of the children. To the poorer members their country is indeed a *Fatherland*, holding out a helping hand for the benefit of all.

MOUTH HYGIENE EXHIBIT COMPLETE.

The Educational Committee of the Ontario Dental Society, some time ago, made arrangements with the Department of Medical Inspection of Toronto Public Schools to reproduce the Mouth Hygiene Exhibit prepared for use in the schools. This is now practically complete, consisting of about 25 full-size cards, 22 x 28, illustrated and bound for hanging up. Copies may be obtained at a nominal cost by writing to Dr. R. J. Reade, Bloor and Yonge Streets, Toronto.

PROPHYLAXIS IN RELATION TO DISEASES OF THE TEETH AND THEIR ADJACENT PARTS.*

BY F. C. HUSBAND, D.D.S., TORONTO.

THE Encyclopedic Dictionary defines medicine as "a science and art first to the prevention of diseases and, secondly, to their cure." The object of medicine then is to prevent disease; its cure is a secondary consideration.

Latterly there has been a great awakening amongst medical men as to the importance of preventing disease, and they are now giving as much time to its study as to its cure. Courses are being given in sanitation, social economy, contagious diseases, etc. Many colleges have now a chair of "Preventive Medicine," and every physician to-day practises more prevention than he does cure.

The history of dentistry is coincident with that of medicine. Let us consider as briefly as possible how we as dentists can practise more prevention than cure.

Prophylaxis means the art of preventing disease and is in no way associated with the art of curing. It is not therapy. Such expressions as "prophylactic schemes for the curing of pyorrhea," or "success in the curing, not only of primary but of secondary stages or phases of pyorrhea by prophylaxis," are quite commonly met with in current literature. Prophylaxis can only be employed on healthy tissues. It consists of measures or systems for the treating of tissues *now* in a perfect physiologic condition and before a pathological sign has yet appeared.

Prophylaxis deals with health. Therapeutics deals with disease. Prophylaxis is not curative, but preventative. Prophylaxis is anticipative, protective, and is simply the art of guarding against the approach of inflammation or disease. One might ask how are we to know in what direction to anticipate disease in order to prevent it. It would seem that the answer to that would be the fact that a pathological condition had once supervened and been corrected and that its return must be guarded against; or phenomena recognized as indicating the approach of pathological conditions which must be prevented.

*Read before the Technique Club, Toronto.

I cannot but believe that prophylaxis, to be direct, must be based upon a thorough knowledge, first of the pathology of the disease which we wish to prevent, and secondly upon as complete a mastery of the etiology. Miller, for example, in his monumental discovery of a method of producing artificial caries, has given us the key to prophylaxis in regard to caries. Our coming master of prophylaxis in relation to pyorrhea, whoever he may be, must prove to us that he can, by definite methods, produce the disease in its various characteristic sequences in a perfectly healthy gum and socket of a tooth. He is not simply to show a primary traumatic gingivitis, but a fully developed, undoubted pathological condition which our keenest investigators will accept as true pyorrhea.

Can we to-day do this, with design, experimentally? Can we by continued local irritation, mechanically or chemically do this when the parts are well nourished with normal plasma? Can we by sowing food debris, filth, bacterial lactic acid, sharp edges, and inequalities in tooth crowns and bad positions, surely reap pyorrhea alveolaris or interstitial gingivitis that will pass muster as genuine cases of either of these phases of the real thing? Or, turning to the other side of the question, can we, by studied and careful selections of food, so reduce the forming of healthy plasma that we can sharply mark the variations in its tissue feeding qualities. We can with certain drugs like lead and mercury produce pathological manifestations in the gingiva and pericementum, but we do not classify these definite phases of gum and socket disease as pyorrhea alveolaris. Or, again, can we succeed in producing this definite and prevalent disease by a double series of experiments, internal in relation to the plasma, and external, by persistent irritation of the gingival borders? Is there a diabetic, a uric acid, an "enzymic," a trophic, a mental or a nervous method of so changing the plasma which is sent to the gums and pericemental tissue cells that it will cause them to lose their innate energy of resistance to injuries and make them degenerate and feeble? Have we any knowledge of a sure way of producing pyorrhea, as Miller did dental caries? If we have not, then our prophylaxis is based, not on modern methods—on physiology—but on experience, the shaky and weak basis of the older practitioner of medicine. At the present time all we can do is to depend upon what we believe to be general and oral hygiene: general as regards diet, fresh air, exercise, bathing, and habits of living of the organism in its struggle to accommodate itself in comfort to its environment; oral, in accordance with what the civilized world has decreed as proper and advisable for the health of the tissues of the mouth, including frequent dental care on the part of a trained modern and scientific profession, and cleanliness of the oral cavity and teeth, maintained by well-advised personal efforts. The tooth brush and strands of floss silk are the

implements used by myriads of refined people in the daily toilet exercises for cleanliness and hygiene of the oral cavity, and thousands of observing and thoughtful dentists throughout the world are giving minute instructions to their dental brothers and to the world about how to use them to prevent possible harm to the gums and teeth. After observing results following minute instructions to patients in the use of these implements, I am forced to admit that failures to succeed in this are out of all proportion to the successes attained. Repeated instructions reduce this number, but the large majority of people seem to find it impossible to acquire the skill necessary to thoroughly cleanse their teeth. When we find these people failing to get the results we desire, themselves, it is our duty to have them present themselves frequently for our assistance, the local cause of both dental caries and pyorrhea alveolaris are removed and we have rendered them in this way a prophylactic service.

Let us look at specific methods in the practice of prophylactic dentistry.

We must assume that the prosthodontist has done his duty, that there are no rough fillings, no projecting or rough margins to restorations of whatever kind, that the contact points are good—in short, that the masticating apparatus is as efficient as it can be made and as near as possible to the normal from the mechanical standpoint. We must assume that the surgeon has corrected all diseased conditions pertaining to the pulp and other soft tissues directly connected with the teeth.

Starting, as it were, with a clean sheet, we have to guard against destruction by two great foes—dental caries and so-called pyorrhea alveolaris

Dental Caries.—Miller's theory of caries is familiar to us all. The bacteria of caries found in the saliva are practically harmless to the teeth unless held in contact with the tooth surface by gelatinous, mucous or colloid plaques. These substances are precipitated on the tooth surface and hold the bacteria in actual contact with the tooth substance, where they go through their life process and their by-products—various acids—gradually dissolve out the calcium salts from the tooth, leaving the organic matrix, which in turn is attacked by the bacteria. While the bacteria actually are the destroying agents they are only so when held in direct contact with the tooth structure while going through their life process. The plaques are the agents which are present or absent according as dental caries is going on or not. Therefore they are the foes which we have to exterminate if we would practise prophylaxis in that direction successfully.

We have two ways open to us:

First, to keep these plaques removed by continually using mechanical means. The dentist must see the patient frequently at regular intervals and polish every surface of the tooth with orangewood sticks having sharp, chisel-shaped ends and carrying moistened flour of pumice, the interproximal surfaces being polished best with silk tape carrying moistened pumice. Oxide of tin used with above carriers makes a good agent for final polishing. The patient must be instructed in the use of the tooth brush and silk tape. The brush should be used with a good powder well worked in. The motion that appeals to me as most effective and that does not harm the gums or cut grooves in the necks or crowns of the teeth is a somewhat oscillating one, with a slight rotary as well as a back and forth direction with a fair amount of pressure—sufficient to make the bristles conform to the surfaces to which the brush is applied—the occlusal surfaces included. This scrubbing should be applied to the gums and the brush gradually directed towards the biting surface of the teeth. The silking consists of passing floss silk or thin elastic bands between the teeth and rubbing the interproximal surfaces free from plaques, care being taken not to impinge on the gum septum. Lastly, when all the debris has been dislodged by these means, comes the rinsing, which should be thorough. Two or three mouthfuls of tepid water swished back and forth between the teeth while the jaws are kept closed serves to thoroughly remove all debris.

The second way open to us consists in discovering if possible the cause which brings about the precipitation of these previously mentioned materials which form plaques and correct that. It has been found that sulpho-cyanate of potash is an important factor in the saliva to control this condition. Its absence is looked upon as unfavorable. Where it is present in sufficient quantity there is seldom any destruction of the teeth by caries. The perchloride of iron test is easily made, and we can determine the presence or absence of the sulpho-cyanate to a degree. How can we obtain its presence in the saliva? Park, Davis & Co. put up a tablet of sulpho-cyanate of potassium in $\frac{1}{2}$ grain tablets, and these, taken when indications demand, increase the amount of sulpho-cyanate in the saliva.

A hydrochloric acid tonic will increase the amount of this valuable agent in the saliva. One of the most destructive cases of caries that has come under my care was checked by this agent. It was also interesting to me to note that the physician attending this patient prescribed on his own initiative this tonic for conditions which he had to correct. Knowing my patient was under his care, I referred

to him to ascertain whether the HCl treatment would conflict with his, and was surprised to find it was the same as he was prescribing. This second method seems to me to be the only rational one, because we strike at the cause of the trouble.

We have previously mentioned general hygiene as a prophylactic measure. This, given a little attention by the patient on the suggestion of the dentist will in itself often work wonders.

So-called pyorrhea alveolaris.—As with caries, there are two ways open to us to combat this disease, viz., local treatment and general treatment.

The local treatment that seems to me to be most effective is the mechanical, not the medicinal. Medicinal agents here, as elsewhere, lose their efficiency when continually used. The use of the tooth brush and a good powder, as previously described, serves to stimulate the gum tissue and frees it from extraneous material which may be adhering to its surface and margins. Frequent visits to the dentist are necessary as long as the tendency to the disease is present, in order to have polished any areas of the tooth surface which may have been missed by the patient, especially those areas just under the free margin of the gum.

Systemic Treatment.—We have not yet seen our master of pyorrhea, but we must not fold our hands and do nothing because we cannot prove our mastery of the disease by producing it.

We have seen pyorrhea supervene temporarily with certain patients—the condition being brought on by indiscretion in over-eating and lack of exercise. When the local products of the disease were removed and the teeth polished and definite instructions given as to general hygiene, the disease did not reappear while those instructions were carried out.

A very troublesome case of pyorrhea which has come under my care and has presented from time to time for treatment is showing marked signs of improvement latterly—in fact, the disease has almost disappeared—after but a few weeks of dieting and observance of hygienic laws—this, of course, in addition to and following local treatment. The whole tone of the gums and mucous membrane of the mouth is healthy. This general treatment, if persisted in then, I feel will be an effective prophylactic measure.

It might be interesting to mention a helpful diet at this point and also hygienic habits. One that is very helpful in combating this disease consists in the following:

Rise one hour before breakfast. Take a cool or tepid plunge or sponge bath followed by brisk rubbing with towel followed by hand rubbing. Sip a cupful or two of cold or hot water.

For *breakfast* take broiled meats or eggs any form not fried, brown bread, fresh or toasted.

For *lunch* take all of one kind of fruit sufficient to satisfy. Occasionally substitute a cereal.

For 6 o'clock dinner take meats (pork and veal excluded) broiled or roasted—not fried—green vegetables—no potatoes. Any kind of salad. No desserts, puddings, etc., but instead take nuts and raisins, figs, etc. No beverage is to be taken at mealtime, but plenty of water must be taken about two hours after meals or about one hour before meals.

In conclusion let me add that the use of mouth washes should be discouraged except for specific purposes and for a limited time. The daily use of mouth washes seems to be contraindicated when one considers the question. They are used for a prophylactic purpose, but do they accomplish this end? Any drug applied continuously internally or externally not only loses its efficacy in a short time, but actually lowers the vitality of the tissue acted upon. Now do these mouth washes prevent caries or pyorrhea? They must dissolve the plaques to prevent caries and remove the debris which locally irritates the gum margin to prevent pyorrhea or so stimulate it to resume its normal powers of resistance that the action of these local irritants will be non-harmful. Do these agents serve these purposes? Clinical observation would lead us to say no.

Prophylaxis then, in summing up, to be rational, would seem to consist in local cleanliness obtained by mechanical means and strict observance of hygienic rules to give the body that health which is its right and which alone can bring health to the parts, medicinal treatment locally and generally being a temporary means of assisting the organism back to the normal.

PASSED THE ALBERTA BOARD.

DRS. J. B. CARMICHAEL and L. A. Maxwell, formerly of Toronto, have passed the Alberta Dental Board. Dr. Carmichael is practising in Medicine Hat and Dr. Maxwell in Calgary, the latter having entered into partnership with Dr. John Clay.

MEETING OF THE CHICAGO DENTAL SOCIETY.

BY C. HAROLD CLARKSON, D.D.S.

AT the forty-eighth annual meeting of the Chicago Dental Society, held recently, some matters of interest to Canadian dentists were brought to the notice of the profession.

One whole day was devoted to a manufacturers' exhibit, which was inferior in many respects to others recently held. Undue prominence was given to vendors of secret remedies and to representatives of public laboratories. The exhibits of Goslee's crown and bridge removable teeth, of Welden's outfit for casting porcelain and of the Teter method of inducing anesthesia with nitrous oxide and oxygen were most noteworthy.

On the evening of the first day Dr. Wm. Bebb of Los Angeles, California, gave a most interesting lecture on the pathologic conditions found in the teeth and skulls of both men and animals. All who heard Dr. Bebb and examined his large collection of skulls and teeth were impressed with the need for such a collection in every dental college. The most ordinary specimens, when arranged in series and groups, furnish most interesting material for thought and study. For instance a collection of "Dentists' Victims," showing teeth lost through improper filling, badly fitting crowns or poor judgment in inserting bridges, was a most striking object lesson on the pitfalls of dentistry. All sorts of apparently useless anatomical specimens may be of great value in the hands of an expert. Let us all lend a hand by sending such specimens in to the College Museum.

On the second day nearly a hundred clinics were given by men from all parts of the States and Canada. Those in oral surgery perhaps attracted most attention. Here and at the various colleges next day some very neat operations were performed; excision of the apices of roots, removal of sequestered and of impacted teeth and implantation of artificial roots being of chief interest. One would judge that in this department we have much to learn.

The clinics in pyorrhoëa were many and varied. Apparently equally good results can be attained with instruments and remedies that differ widely; the skill and patience of the operator being of primary importance.

The Gilmore attachment, consisting of a T-piece fitting into a special clasp, was shown in many applications to partial dentures and removable bridges. One new feature which struck the writer as having unlimited possibilities was the department of circulatory clinics. This was a collection of table clinics which are preserved from previous meetings and are a source of perennial interest. In this way many exhibits which are prepared at considerable expense are used again and again and may eventually be of value for museum purposes.

The paper of Dr. G. V. Black on his studies of Deposits of Calculus was in many respects a remarkable production. It was a treat to sit at the feet of this old hero, now, alas, showing that the burden of years is pressing upon him. Many a young man must have felt rebuked that it should have been left to this old patriarch to make some simple observations which everyone should have seen long ago. Do our dental colleges lay enough stress on training men to use their eyes and their common sense? I think not. Dr. Black's studies lead him to think that the formation of Calculus is coincident with over-eating and that the different calculi are all the products of an overloaded system.

ENTERTAINMENT AT CHICAGO.

BY W. E. WILLMOTT, D.D.S.

HELLO! old man! How are you?" "Mighty glad to see you!" "Come on to lunch with me!" "Come to the theatre with me to-night!" "Come out to supper with me!" and many more such phrases were the expressions one heard on every side all day Monday and Tuesday at the Illinois School and, Wednesday, Thursday and Friday, at the La Salle Hotel. This indicates in a very slight manner the warmth of the welcome and the prodigality of the hospitality of the Chicago Dentists continued throughout the week. On Wednesday evening the schools and the profession of the city tendered a banquet to the visitors. After a bounteous repast, the Very Rev. Dean Summer gave a most inspiring and instructive address on the progress made in Chicago during the past few years in matters pertaining to public health, philanthropy, education, protection of children and the social evil. Here certainly is a busy man, as, in addition to his numerous and

varied duties as dean of Chicago Cathedral, he takes an active interest in many public organizations, belonging to forty-one different societies, most of which are philanthropic or educational. He was chairman of the Vice-Commission and is chairman of the Board of Education. Hence his ample knowledge of the subjects on which he spoke.

A large number of lantern slides were then shown, exhibiting the marvellous possibilities of color photography. Whether in a landscape, in a garden, in a water scene or in a human face, every color and every shade was perfectly reproduced. This was the more wonderful to many present when it was explained that the colors were all brought out in the developing of the plate and none had been otherwise applied.

At the close of the evening's proceedings we had the pleasure of a visit and a short address from Sir Mackenzie Bowell, who had been attending a Belleville Old Boys' gathering in another part of the hotel. He was accompanied by the Governor of Illinois, whose father was at one time U. S. Consul at Belleville.

On Thursday the members of the Institute were given a luncheon in the Northwestern School, at which all those connected with a certain department in their school sat together. Thus all the operative teachers were at one table, all the orthodontia teachers at another, and so on. This thoughtful arrangement added largely to the pleasure and profit of the hour. An automobile ride through the principal business streets and through a portion of the residential district of the West Side brought the whole party of about a hundred to the Chicago School.

About twenty of the visiting dentists had their wives with them. These were royally entertained by a committee of Chicago dentists' wives, under the able guidance of Mrs. Dr. Gallie. The entertainment included a theatre party, a luncheon at Marshall Field's and the inspection of the entire building and a trip through the post-office. These courtesies were very much appreciated by the visiting ladies and made their stay in the city far more pleasant. Apart from these formally arranged functions for all the visitors, there were numerous private theatre and luncheon parties and side trips.

The busiest man in Dentistry to-day is a Canadian residing in Chicago. Still, however busy Dr. C. N. Johnson may be, he is never too much so to extend a hearty welcome and some pleasing courtesy to a fellow practitioner from his native land. On this occasion he entertained all the Canadians attending the Institute at a delightful luncheon at Marshall Fields'. Everyone regretted Mrs. Johnson's absence from the city, but her daughter made an ideal and

charming hostess. How could a daughter of her father do otherwise? This thoughtful courtesy on the part of Dr. Johnson was very much appreciated, and the event will be remembered by those present as the most enjoyable of the entire visit.

To the local committee, consisting of Drs. Goslee, Arthur Black and Dittmar are due the most hearty thanks for the very careful and thoughtful manner in which they looked after the comfort and pleasure of the visiting members.

Almost every state in the Union, as well as Ontario and Quebec, were represented at the meeting of the Institute, and those sufficient fortunate to be present will agree that according to the proverbial hospitality of the South and of the North the future maps of the United States should show Chicago either down South in Florida or up North in Alaska.

SINGLE VERSUS FREQUENT TREATMENT PRIOR TO FILLING ROOT CANALS*

BY J. H. GASKILL, D.D.S., PHILADELPHIA, PA.

Continued from last issue.

Where we have an incipient or what is popularly known as a blind abscess there is a different condition to treat, and in one instance where immediate filling is not indicated. In this class of cases the symptoms are, a tooth raised from its socket by the thickening of the membranes, sore to bite on, and until considerable swelling occurs, a great deal of pain. Here again we must open the tooth with antiseptic precautions. Usually upon opening into a tooth in this condition there will be an exudation of pus; allow this to drain freely, then wipe out the canal with creosote, then dry the canal and pack loosely in the root a strand of cotton saturated with creosote, protect this with only cotton and sandarac varnish, allowing it to remain twenty-four hours; usually this one treatment will be sufficient for the cessation of all soreness and pain; if at the next sitting all unfavorable symptoms have disappeared, fill the root, using the method for putrescent pulps. It has been my experience that in these cases, if a treatment is allowed to remain for more

than forty-eight hours there will be a return of the soreness with more pus, so I make it a rule to see my patient at the end of twenty-four, or not more than forty-eight hours. I here want to emphasize the statement that in case of a blind abscess, a gutta pereha or other hard filling used to seal in the medicament will almost invariably result in trouble by a continuation of the soreness and formation of more pus. Why this should be so, is hard to say, but that has been my experience. It may be that there is a certain amount of exudation from the infected membranes, and by tightly sealing the root canal this cannot pass out; so its pressure will act as a further and continued irritant and so prevent healing, which might otherwise have taken place.

Now my reasons for immediate filling of root canals are that the activity of a drug as an antiseptic diminishes by the chemical change which takes place while in contact with the substance on which it is to act; after the dressing has remained in the tooth for a certain time, the drug gradually becomes inert, it has expended its force. Certain of the drug's characteristics may remain, as for instance the odor, but its real value will be lost; in a little longer time the cotton will become infected and then the tooth substance itself, so that our work will have to be done over. The greatest medical activity of an antiseptic is when first applied; after it has destroyed a certain number of bacteria it begins to lose power and so on until in the cotton we have a vehicle for holding and propagating micro-organisms instead of destroying them.

Why is it that sometimes a cotton dressing will remain in a tooth under a filling for years without giving trouble? It may be that the filling is of such a character that the bacteria cannot enter from the cavity, and the only source is from the apical foramen or through the dentin, but infected it does become, and we have a smouldering volcano, and so frequently that it is a mistake to trust it.

Now as to repeated treating at short intervals. A tooth broken down by decay is a diseased tooth, the pulp may die, it becomes infected and putrefaction sets in, the small fibres in the dentin become infected, we use a treatment to destroy these organisms of infection, the part is made sterile, so that it is as near normal again as it can be made; we go on applying drugs, what is the result? From acting as curative agents, they begin to act as irritants and the parts are not allowed to rest, and so on until there may be such a protest from nature that the tooth may be lost. I frequently have had patients say, "I had a tooth treated for weeks or months," and I would say, "and you lost your tooth"; and more often than not the answer would be, "Yes." A tooth is a vital tissue, susceptible to influences as other tissues of the body. I believe there can be a

complete destruction of the peridental membranes by repeated treatments of the root canal, the action may be through the apical foramen or through the tubuli of the dentin. Take, for instance, arsenic; can we tell where or when its action has ceased? We know the pulp can be destroyed by applying it to the dentin, and we cannot prevent the loss of the pulp after one application; carbolic acid will so destroy tissue that several applications at one point will make an ulcer that it is difficult to heal; iodine in a couple of applications to the mucous membrane will cause it to come off, creosote will also destroy tissue, chlorid of zinc will act through considerable area, and so on. Now, how can we tell when harm has been done until it is too late? The surgeon after an operation, as a rule wants the parts operated on to remain free from all further interference so as to allow healing by first intention; he is not continually opening the wound and frequently applying drugs, no; after his operative work is done and there has been no infection he lets things alone and hopes and expects to get results, and further treatment will be interference rather than a help.

DISCUSSION.

Dr. Edwin T. Darby: The subject of the paper does not need much discussion. I think, in the main, we agree with Dr. Gaskill in what he has said. I would like to ask Dr. Gaskill where he gets his beechwood creosote. I have not found any beechwood creosote in America for thirty years. I think most of it is made of coal oil. Thirty years ago I got a bottle of Squire's wood creosote in London, and I do not think I have seen any since then. I do not think it is to be had in our market. If it is, I should like to know where to purchase it, as mine is nearly gone.

I think Dr. Gaskill is right, that some men treat the teeth to death. I recall a practitioner who used to treat a tooth three, four or five years, and by the time he was ready to fill it, the tooth had nearly gone to pieces. Patients of his have come to me and told me about this treating their teeth for two, three or four years, during which time he would insert gutta-percha fillings or, more sandarac and cotton, and every two or three weeks during this time, they would have to come back for treatment. I should call that treating the teeth to death. I do not quite agree with Dr. Gaskill in regard to filling the root immediately after extirpating the pulp under cocain pressure. Before cocain was introduced, I had some experience with carbolic acid and chloroform, injected with a small syringe and camula for the purpose of anesthetization and I found that I could anesthetize as well with carbolic acid and chloroform as I can with cocain, and in a great many instances I have used carbolic acid and chloroform instead of cocain. I do not feel quite safe, however, in filling the canal of the tooth immediately after the pulp

has been extirpated. Perhaps, in the majority of instances, I would have no trouble, but I have always been rather slow to burn my bridges behind me. I feel better satisfied if I put in a dressing for twenty-four to forty-eight hours with a gutta-percha seal. I say that, in the majority of instances, perhaps no trouble would supervene, but in some instances I have had more pericementitis following the anesthetization of the pulp with cocain than I ever had with arsenic. I think this is the experience of a great many practitioners. I know, since cocain was introduced, many men have asked me the question, why there was so much pericementitis? This can be explained in only two ways: the first is that the cavity has been infected by some septic material, and the second is that it is due to secondary hemorrhage following extirpation of the pulp. But in any event, I feel better satisfied if I have the tooth under observation for from twenty-four to forty-eight hours after extirpation of the pulp before it is filled. With regard to the treatment of teeth with putrescent pulps, Dr. Gaskill is a little more optimistic about it than I would be. I like to test the tooth pretty well after I have worked in the root canal before I fill it permanently. I make a dressing or two, and if I find the tooth comfortable after forty-eight hours, I fill it permanently.

Dr. D. Hayes Clement: About twenty-five years ago I found myself in a small country town, with the theory that the frequent stopping and unstopping of teeth was the proper way to save them. One day an old farmer came into my office and said that he wanted a tooth treated. It was an upper right cuspid. I said to him, I can save that tooth by frequently stopping and unstopping it. He said, "I want you to take that tooth out at once." It then occurred to me that the tooth was normal in every particular, except the pulp, and that if the pulp could be removed without disturbing the outside, there was no reason why the tooth should not be filled at once. I then followed the method which I think Dr. Cryer taught me, and removed the pulp by the stick and mallet method and filled the tooth immediately, and I didn't see the patient again for some time, and then one day he came into my office and said, "I have some more teeth I want you to treat like the last one." I asked him how the tooth had been, and he said it had given him no trouble; and since that time I have been treating single-rooted teeth and filling them immediately. I take my hat off to the men who originated the pressure method, for that made it possible to fill multi-rooted teeth immediately. The man who practices in the country cannot be a specialist. He cannot have the farmer leave his harvest and come into town two or three times a week to have the roots treated. The treatment by the cocain method enabled us to fill the teeth immediately. I have used carbolic acid in the country, and it seems to

me that it does not make much difference what you use, the pressure is the important thing. The anesthetization is purely mechanical. You will anesthetize by cutting off the circulation at the end of the root. After a few failures with the cocain, I started to use it in this way. I use a small portion of cocain on a piece of cotton, and force it up into the root as far as I can, which must be done with great care in order to avoid forcing it through the apical end of the root. I use a spiral broach, and I twist it into the pulp and remove it nine times out of ten without any hemorrhage. If I have an aseptic root canal, I treat it with the beechwood creosote, which Mr. Frank E. Morgan claims is wood creosote. I use it as a preservative of the tissue. I treat that root in this way before filling it, and then we come to the most important matter. I use an electric mouth mirror which enables me to look up into the apex of the root. I dip the gutta-percha point into the creosote and then pass it to place. I have never had any soreness that could not be removed instantly. I do not think I have had any trouble with one per cent. of the single-rooted teeth in the last four years. I want to say a few words in regard to carbolic acid treatment of the pulp. With me the plan has worked out perfectly every time. I simply take a small piece of cotton, after I have exposed the pulp. If the outside of the tooth is normal, I saturate the cotton with carbolic acid and push it up through the exposure of the pulp, and I can tell by the transmitted light when I reach the apex. I want to say that I have had that operation performed in my own mouth by Dr. Gaskill.

Dr. F. D. Gardiner: I am very glad that Dr. Gaskill has written a paper on this subject. In the main, I agree with all that he has said. It has been my practice in abtunding pulps under pressure to fill them immediately, and in the small percentage of cases where pericementitis had intervened, I had always supposed I had either forced some of the medicament through the end of the root by pressure, or that the trouble came from hemorrhage. In cases with considerable hemorrhage—more than very slight—I would not consider to be favorable for immediate filling. I think it would be better in the case of hemorrhage to dress the tooth and not fill it until a subsequent sitting. I would hesitate, however, about the immediate filling of root canals that had had putrescent pulps. I never could feel quite sure enough to do that, because I never like trouble.

Dr. G. L. S. Jameson: In the main, I agree with Dr. Gaskill, and I am inclined to follow his cautious method. I do not hesitate to destroy a pulp and fill the tooth at the same sitting, if the circumstances are such that it would not inconvenience the patient to have it done. I would prefer, however, to treat the tooth for at

least twenty-four hours after I have used cocain under pressure. In other words, in forcing cocain in, I first use a piece of unvulcanized rubber, and then temporary stopping over the rubber. I prefer to dress the tooth (unless it is a great convenience to the patient to have it done at one sitting) at least once, to be sure that there may be no soreness, and if there is, it ought to be treated more than once. I enjoyed Dr. Clement's positive statement. I know that he gets good results. I am glad to know that it is possible to see the outlines of the roots through the alveolar plates with an electric lamp held within the mouth as positively as Dr. Clement claims. I think I shall have to adopt that method, and I would like to get a mouth mirror that would enable me to see the roots in that way. I have never been able to see the roots, except by means of the X-ray. I have never felt that the gutta-percha points can be used with the exactness (at least, I cannot use them with the exactness) that some people do. My experience has been that such a fine gutta-percha point is likely to buckle, so that I generally work it up a little at a time, first with chloroform, and then add to the first piece until the root is filled. I use sulphuric acid to a certain extent in my practice, and I believe I get better results than by curetting and using hydrogen dioxid. I first use sulphuric acid, and then bicarbonate of soda, and I follow this by drying the tooth with hot air, and then I dress it with creosote.

Dr. H. C. Register: Mr. President, I have been very much interested in the filling of root canals, and I not for a moment hesitate to say that Dr. Gaskill is perfectly correct in his first statement in regard to the removal of devitalized pulps, followed by immediate filling. There are two classes of conditions that we have to deal with in operating upon pulpless teeth: first, those which we have operated upon with the plp in a vital condition, and from which we have removed the pulp, and second, those where the pulp has been dead. In the removal of the pulp, where the tooth is operated upon in a vital condition, I consider that the pressure method is the best one that has been given to the profession. It can be done with cocain or with other medicinal agents. I think carbolic acid operates quite as expeditiously and as certainly as cocain. I do not believe that any medicinal agent is forced through the apical end of the root, but I do believe that a clot will sometimes be formed and extend into the apical space, and where that is the case, it may cause trouble, although it will probably, as a rule, pass away very quickly. While I agree with the essayist in regard to the application of carbolic acid and creosote on new tissue, I most heartily disagree with him in regard to operations upon old chronic tissue where the pulp is dead and has passed into a gangrenous condition. I think in the removal of pulps of that kind, the use of coagulents of any nature is contraindicated. I think that we need rather to use

a solvent in such cases. In regard to hemorrhage following the removal of the pulp under pressure, I do not think that it amounts to very much, and that it can be stopped almost immediately. If it cannot be stopped by carbolic acid, it can be stopped by the application of a very small quantity of nitrate of silver applied on a broach, which will immediately cauterize the apical end of the root. In removing putrescent pulp, if you approach the edge where the fibrils run into the dentin, and inject a good germicide in there, you will have no more trouble. You can take the old chronic cases and open them up and treat them with germicides and compressed air and have them just as sterile as the new cases. It may take one or two treatments to do this, but it is rarely necessary to use more than two treatments. In regard to filling the canals of the teeth, I do not think that it makes very much difference what we use. I am very indifferent as to what I fill the canals with, as I feel that any article I use that will fill the space is all right. During late years I have been using standard alloy, and I wash it very carefully with alcohol, and it will stay there as long as the tooth will remain in the jaw. I do not believe that it has any more influence in producing trouble than any other material that can be used and it is very much more permanent.

Dr. A. P. Lee: I feel that possibly we are accusing Dr. Gaskill to-night of being more radical in his methods than his paper would imply. Dr. Gaskill has been in practice a number of years, and there is no question but that when he has these complicated cases before him he treats them with as much broadness of spirit as the rest of us would. We all know that he is producing results. Where all of us differ, possibly, is in our methods, and we may not agree with the methods that he is at present employing. I am frank to say that I do not now fill as many canals immediately after pulp removal as I did at one time. On the other hand, I believe I am giving fewer treatments in the case of putrescent canals than ever before.

I cannot understand what has become of all the adherents of the oxidizing agents (sodium dioxid, pyrozone, kalium-natrium, etc.) which were so popular a few years ago. Dr. Gaskill spoke of using creosote almost exclusively. I would like to ask him what is his idea in using a coagulant in putrescent conditions rather than one of the oxidizing agents. I would also like to ask him to what he ascribes his failures to which he refers as having occurred when he attempted to follow Dr. Buckley's method. I have been using Dr. Buckley's treatment for the past two years, and I do not know of any method of treatment in any line of my work that has given me such universal satisfaction.

In infected cases, where pericemental inflammation is not pre-

sent, I consider the sanest and safest method to be the application of formocresol in the pulp chamber, not attempting in any way to remove the canal contents, lest while in this highly infectious state they be forced beyond the apex. In regard to the canal filling materials, I feel, as Dr. Register does, that it matters little what material we use or by what method we do the filling, so long as the tooth is thoroughly filled. I lean towards oxychloride of zinc, using a gutta-percha cone as a central ore.

Dr. E. L. Kanaga: There are a few points that I would like to mention after listening to the discussion of the paper. I am in the habit of using the Kerr broaches in root canal work. The Kerr broaches are made in varying sizes from very fine to coarse and extra coarse, and it is the coarse broaches and the extra coarse ones that I am in the habit of using. I am very much against the very fine broaches, because they are really too small to have the strength required. In using these broaches I find that they themselves are pretty good indicators of when you have reached the end of the root. The portion of the root at the apex is considerably harder and of more dense texture than the portion above. You will find that the Kerr broaches will cut very readily until they reach that point when they will begin to twist very much harder. When they begin to twist hard then you have reached the end of the root. If you are not careful they will twist into the hard, dense structure at the apex of the root and break off. In regard to hemorrhage, in my slight experience, I have found that it is more or less readily controlled, with a second application, if necessary, of cocain and adrenalin chlorid, or adrenalin chlorid alone under pressure. I usually make a second application of adrenalin chlorid under pressure, although the pulp may be perfectly anesthetized, in order to insure that there will be no hemorrhage when I come to remove the pulp. I always fill immediately after extirpating the pulp. I say always because that is my general rule, although there are a few exceptions, of course. Where the pulp is removed without hemorrhage I have no hesitancy in filling immediately. If I have hemorrhage, I prefer to wait a day at least.

Dr. Howard E. Roberts: I feel the necessity for treating root canals after the removal of the pulp, prior to filling. While Dr. Gaskill may treat putrescent pulps and fill the root canals immediately—that is, treat the roots which contained putrescent pulps and fill the canals immediately and have great success—I have always been afraid to do it, because I have had trouble with such cases. I do think, however, that we are getting to treat them less frequently than we used to. After removing the pulp under pressure, if there has been any hemorrhage, I prefer to apply a dress-

ing and let the parts thoroughly heal before I fill the canal. I cannot see how the drugs, no matter what you employ, can be forced through the apex of the root and cause inflammation of the membrane. I can see how the broach can be forced through the apex of the root, injuring the tissues and cause inflammation of the membrane, because in removing the pulp we remove the pulp to the apex of the root, and it is at the apex of the root where it is twisted off. If we carry the broach beyond that we injure the tissues, and that may start inflammation which will extend to the tissues. I have never had soreness after removing a pulp under pressure, but occasionally I have had tenderness that evening. In the treatment of putrescent pulps my practice has been to thoroughly clean out the roots with the Downy broach or the Kerr broach, and as thoroughly as possible remove the tissues immediately affected along the route of the canal. For a dressing I prefer the tricresol of formalin, with a little oil of cloves. That seems to work like a charm. I have had no trouble whatever from the use of formalin in the root canals. After making a dressing of that kind, I like to change it in forty-eight hours and put a second dressing in. After that, if there is no trouble, I do not hesitate to fill. If the cotton has the odor of the medicant, I do not hesitate to fill. If the cotton shows evidence of continuing infection I would rather sterilize the root thoroughly before filling, by the application of another medicament that will deodorize, as well as sterilize the tubuli. Where there is a fistulous opening, so that I can get the medicaments through the canal, I do not hesitate to fill after one treatment. Sometimes it will heal with one application. I want, if possible, to force the medicine through the canal. There is another thing that is of vital importance in filling the canal, and that is to see that there is no air in the canal in advance of the gutta percha point. If the canal is flooded with chloroform carefully, the chloroform will flow to all parts of the canal; then if the gutta-percha is carried into the chloroform, it will soften and dissolve the gutta-percha and it may be carried up clear to the end of the root. In that way you can fill the smallest portion of the canal.

Dr. I. N. Bromell: I have always believed that slight hemorrhage after the extraction of a pulp was beneficial, rather than otherwise. That is especially so, it seems to me, where we are considering the possibility of infection. If we can control this hemorrhage, as we usually can, it seems to me that it is of decided advantage. The discussion seems to be entirely in reference to the filling of pulp canals. This is comparatively simple, but it seems to me it is a much more difficult matter to get the pulp canals into a condition to receive the filling material. That seems to me to be the most difficult part of the work. Unless the pulp

is removed under aseptic conditions, there is bound to be more or less possibility of infection. Especially is this so if the teeth themselves are more or less infected. The action of cocain and other pressure anæsthetics has been attributed to the fact that strangulation takes place at the apex of the root. I want to take exception to that theory. I do not believe that it is correct. First, because we can get anæsthesia by injection without pressure, and, secondly, because we can get the effect in young teeth with wide open foramina. Just to-day I extracted the pulp from a twelve-year molar in a child fifteen years of age, and I am quite sure the root apices were not sufficiently closed to make strangulation possible in that case. Dr. Register has spoken in regard to the odontoblastic layer and stated, I think, that we should be very careful that this layer comes out with the pulp. It is only by means of the odontoblastic processes that we have the pulp adhering to the walls of the canal, and certainly, if we extract the pulp in toto, we must bring out the odontoblastic layer, unless it be in very young teeth where the process of calcification is just beginning.

Dr. Frederick W. Allen: I think one of the most salient methods of treatment of the putrescent root canals is the reaming of the canal wells. That does away mechanically with the necessity for repeated medication. It cuts away the tissues of the canal, which Dr. Register says may be the seat of infection, and enlarges the opening between the enamel and the dentin. After mechanically removing that, I do not see the need of medication. That will almost render the canal immune from further aseptic conditions. Furthermore, the advantages of making a larger opening are that it renders the filling of the same easier. I know of the successful operations of one of our dentists in town, who does an enormous amount of work, especially that class of cases which calls for the removal of the pulp, and his method is successful in almost one hundred per cent. of his cases. He uses a series of drills, exceedingly short and especially thin for the interior, and that fact renders the treatment of the canal almost a surety. The gutta-percha cone cannot be used unless the canal has been reamed to quite a large size. In the few cases where it can be used it has given excellent results. In the extirpation of the pulp, I think we will find the action of distilled water much more efficacious than cocain. The use of the Buckley method is highly efficient if carried out according to the directions laid down by Dr. Buckley.

Dr. H. C. Register: I would like to say a word in regard to Dr. Broomell's remarks as to the odontoblastic layer and its relations to the pulp. I have on two or three occasions, where I have floated out the pulp from single-rooted teeth, had tissues left along the broader

lines of the canal, that I feel sure was the odontoblastic layer, which was holding on to the prolongations of the fibrils and extended into the dentine. In removing freshly devitalized pulps this would not be likely to take place. Undoubtedly, to my mind, the odontoblasts are little ganglia. I believe them to be tissues that pass from the pulp into the dentin, furnishing all that is required for that tissue, and that that anatomical condition must exist. I think it is a wise plan always to cut away that surface of the dental wall and open up into the tubules, so that the fibrils can be thoroughly reached and controlled. What I wished to make emphatic in my remarks in regard to medicinal agents was in regard to leaving tissue which was devitalized. Where the pulp has just been devitalized, coagulants are the proper remedy, but not where the tissue is dead or gangrenous. In that case, a solvent and not a coagulant is the proper remedy.

Dr. J. H. Gaskill, closing: I am very much gratified with the way the subject has been received, but a little disappointed that the discussion has taken the turn that it has. There has been practically nothing said to the disadvantages of repeated treatment of the root canals prior to filling. The reason that prompted me to read the paper to-night was that I believed the continued placing of drugs in the root canal will do a great deal of harm and cause a great deal of damage. Dr. Darby asked me where I got beechwood creosote, and in reply I would say that I got it from Mr. Frank E. Morgan, who claims that it is the extract of the pure beechwood tar. He spoke of the use of cocaine as having produced only a slight hemorrhage and was afraid of pericementitis. I have seen profuse hemorrhage where cocaine had been used. Possibly where adrenaline is employed in conjunction there will not be hemorrhage. While I was using cocaine I almost invariably had sore teeth. Since I have been using carbolic acid soreness very seldom occurs, and if it should occur an application of a counter irritant will almost invariably relieve it in a few hours. Dr. Jameson spoke of the use of chloroform. I use oil of eucalyptus for reasons: the first is that it is an antiseptic, and the second is that it is a solvent and allows the point of gutta-percha to slide up, so that in filling the canal it makes a strong antiseptic filling. In regard to the frequent use of drugs, as I stated in my paper, how can you tell where their action will stop? Of course, we can use antagonizing agents, but we do that when we fill the root at any time. Dr. Lee said that I undoubtedly only treated exceptional cases as I had outlined in my paper. It is my general rule to practice as I have stated in my paper. There are cases which come to me that could not be treated at one sitting, but they are the exception rather than the rule. Why do I use creosote? Because it is one of the most powerful antiseptics that we have; it is one of the most penetrating, it will pratei-

cally go through most substances in and about the teeth and so render the parts aseptic. In regard to being a coagulant, beechwood creosote is not as strong a coagulant as the coal tar product. In making the dressing you had forced some infected material up reply to another remark of Dr. Lee's, in which he said that possibly through the root. If there is pericemental trouble there is already an infection. As to forcing drugs through the apex of the root, I think it very seldom, if ever, occurs.—*P. B. McCullough, Editor for the Academy.*

EXTRACTED TEETH WANTED.

IT is becoming increasingly difficult from year to year to obtain extracted teeth for teaching purposes. Members of the profession having any they do not wish to use will confer a favor that will be much appreciated by sending them to Dr. W. H. Doherty, Dental College, Toronto.

OUR FRONTISPIECE.

Our frontispiece this month is taken from "Human Pearls," by Francis Eaton Burrett, D.D.S.

WAX YOUR MECHANICAL SAWS.—A little wax rubbed along the teeth of the mechanical saw that you use to cut off sprues with will make the saws run smoothly and cut in a truly astonishing manner.—*Arthur G. Smith, D. M. D. (Review).*

A PRACTICAL SUGGESTION.—In mending a broken arm—no surgeon would expect a cure without giving the injured member rest. Don't forget this important fact when you handle your next diseased tooth, be it from pyorrhea or any other cause.—*A. E. DeRiemer, D.D.S. (Review).*

THE TEACHING OF HYGIENE IN SCHOOLS.

Extract from Bulletin Texas Board of Health.

THE field of hygiene embraces many different subjects. For it includes not only all of sanitary science and the sanitary arts, but a large part of physiology and even of biology as well. It includes not only questions of water supply, milk supply and sewerage, but also much of climatology, foods and feeding, clothing, heating, lighting, ventilation, vaccination, scavenging, the personal care of the body, work and overwork, sleep, rest, fatigue, exercise, play, sports, noise, crowding and over-crowding, and other subjects too numerous to mention, but comprised in part under the heads of public hygiene, personal hygiene, municipal sanitation, school sanitation, household sanitation, etc.

“To give the child a complete education, one that takes into account his whole nature, the physical as well as the mental development, it is necessary that personal hygiene be taught in the elementary grades, followed by an advanced course of public sanitation in the high schools, colleges and universities.

“Personal hygiene includes problems relating to proper foods and feeding of the individual, his sleep and rest, his work and fatigue, his muscular exercise, stimulants and narcotics, the care of the eyes, the ears, the teeth, the bowels, the hair and other organs, clothing for special conditions, etc.

“I believe the younger children could be made to understand the first principles of hygienic teaching; the functions of the teeth and the importance of the use of the tooth brush for the purpose of protecting the teeth from premature decay; the care of the eyes, never to read lying on the floor, or the couch, or by the firelight or twilight, or with the book shaded, to carefully avoid facing a lamp or other bright light while reading or talking; personal cleanliness, the care of the body, the necessity of bathing; that the ears should be kept free from the accumulation of wax by daily washing; that the food should be simple and nutritious; the proper clothing to wear for the protection of the body during the different seasons and the necessity of removing at night all clothing worn during the day. In my practice I have observed children clothed in undergarments, stockings and skirts worn during the day sleeping in rooms where the windows were closed at the beginning of the winter season, with the crevices stuffed with papers and other materials, to the exclu-

sion of all air, which is contrary to the rules of hygienic teaching. Such conditions as these just mentioned have a decided tendency to weaken the vitality of a child, therefore making him a proper subject for tuberculosis and other diseases.

“Students of the high schools, colleges and universities should be compelled to take a course of study in public hygiene which should be considered of as much importance as other studies in which they are examined. Public hygiene includes all subjects, as you all know, relating to villages, towns and cities, the water supplies, drainage, milk supplies, ice supplies, the control of contagious and infectious diseases, heating, lighting, ventilation, school sanitation, municipal sanitation and other subjects relating to public health.

“In conclusion, I think you will all agree with me that it is necessary that the teachers before receiving certificates be thoroughly examined in this subject, and that they be sufficiently familiar with the subject to teach it intelligently.

“It would be an easier task to enforce health laws if the coming generation understood the fundamental points of public health matters. Every effort in the prevention of disease may be regarded as an important step in the prevention of poverty and distress.—*The Practical Dental Journal*.

DR. TAGGART WINS HIS SUIT.

JUST as we go to press we receive word that the suit of Dr. W. H. Taggart against Dr. George W. Boynton, of Washington, D.C., has been decided in Dr. Taggart's favor. The following copy of the decree will show the explicit ruling of the court, and must suffice at present for further comment on the case. It has been a long drawn out contest entailing a severe strain on those interested, and it will be a relief to all concerned to have it decided: *In the Supreme Court of the District of Columbia. William H. Taggart vs. George W. Boynton. In Equity, No. 27927.*

DECREE.

This cause having come on to be heard on the pleadings and proofs, and the court having heard the argument of Russell Wiles, Esq., and Francis M. Phelps, Esq., on behalf of the plaintiff, and of E. T. Fenwick, Esq., on behalf of the defendant and being fully advised in the premises, finds as follows:

1. William H. Taggart, the plaintiff herein, is the owner of

Letters Patent of the United States, No. 872,978, for a method for making molds for dental inlays and the like.

2. Said Taggart was the first, sole and original inventor of said method and said method involves patentable invention over the prior art. It was not known or used by others before plaintiff's invention thereof or more than two years prior to Jan. 12, 1907, and the defenses of prior knowledge and use, and of public use more than two years before the filing of the application are not established and are overruled.

3. Letters Patent of the United States, No. 872,978, are therefore good and valid in law as to each claim thereof.

4. Defendant, Dr. Geo. W. Boynton, has infringed said patent by practicing the process thereof in the District of Columbia since the grant of the patent and prior to the filing of the bill herein.

5. Plaintiff has not prayed for damages in his bill and has limited his prayer to that for an injunction and general relief.

It is therefore ordered, adjudged and decreed that defendant, George W. Boynton, his agents, servants, attorneys and workmen be and hereby are enjoined from further infringing said patent and from further practicing the method thereof, and that a writ of injunction to this effect issue out of this court.

Further ordered that defendant pay the costs of this suit to be taxed by the clerk and plaintiff have execution therefor.

HARRY M. CLABAUGH,
Chief Justice.

Approved as to form,
Francis M. Phelps,
Dyrenforth, Lee, Chritton & Wiles,
of Counsel for Plaintiff.
Edward T. Fenwick,
of Counsel for Defendant.

—*Dental Review.*

You owe so much to yourself that you can't afford to owe anybody else.

No man drops into a better world by dodging this one.

Think twice before you speak and then talk to yourself.

HEALTH OF MONTREAL SCHOOL CHILDREN.

ACCORDING to reports fifty per cent. of the pupils attending the Public Schools of Montreal are in an unhealthy condition, according to the reports of the city medical officers. The report presented to the Board of Control recently by Dr. Laberge, Medical Health Officer, showed that out of a total of 59,685 children examined by the municipal health authorities during the past year 27,349, or almost fifty per cent., were found to be in an unhealthy state. Of this number, 19843 were suffering from diseases of the mouth, defective and decayed teeth, and gum affections, all of which Dr. Laberge declared to be the forerunners of diseases such as tuberculosis, scarlet fever, diphtheria and throat affections.

Of the remaining 8,000 or more, 1,416 had to be sent home from school; 2,140 children were found to be not vaccinated. Notices to have their children immediately looked after by their family physicians were sent in 20,028 instances, while 634 children had to be specially treated for bad eyesight. The medical inspectors paid many visits to barber shops, butcher shops, and other places where instructions as to cleanliness were given.—*The Globe*.

CORRESPONDENCE.

RE CONVENTION PROGRAMME.

TO ORAL HEALTH:

I should be more than pleased to have a good practical as well as scientific essay and discussion on diseases of the gums (pyorrhea if you will), something that will actually let in some light to those of us who are seeking knowledge along this line. It seems to me that this is the one phase of dentistry that receives the least attention, and that we consequently know the least about.

I would like also to hear some practical ideas on porcelain work. Something along the line, "Is it Practical? When and Where Indicated?" Are there any advanced ideas in technique, if so, what are they?

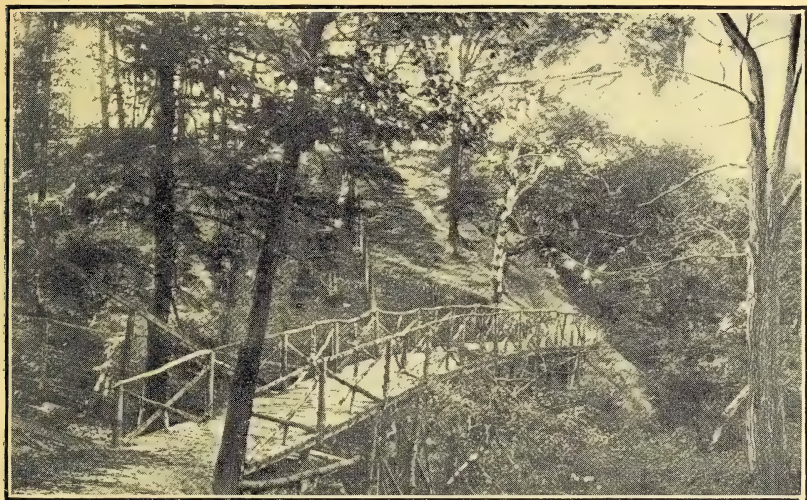
Another. Is there any degree of permanency to silicate cements? What is the extent of their application? I would like to get some information on these subjects.

Sincerely yours,

A SUBSCRIBER.

MEET ME AT BURLINGTON.

Uncle Tom.



INDIAN POINT, BRANT PARK.

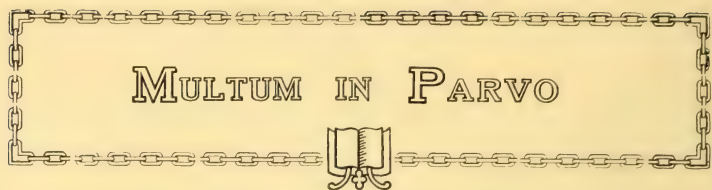
UERY close to Brant Hotel, the scene of the coming Canadian National Dental Meeting, is an old gnarled oak, known as the Council tree. Here the historic Brant held court in the days when fish and game were the only fruit in the valley now known as the Garden of the Dominion of Canada. It was here at Indian Point that the great pot-latch ceremonies took place.

Tradition tells the story of a beautiful Indian girl's tragedy during a pot-latch festival. The girl, given in contract to a young ambitious chief, stole away in the night with her own true lover across the bay.

The young chief, her fiancé, discovered the flight in time to give hot chase, and at the marsh, now Dundas Valley, he caught them. Each warrior sprang at the other's canoe. They sank together, the chief with his teeth buried in the neck of the girl's lover, but with his scalp trailing a bloody streak in his rival's hand. The Indian maiden crouched in her canoe, waiting for the victor to rise, with a tomahawk poised for the chief's head. For two suns she waited, then paddled home.

It is from this tragedy that tradition dates the trouble between the tribes of the Hurons and Iroquois.

“UNCLE TOM.”



This Department is Edited by C. A. KENNEDY, D.D.S.

Librarian Royal College of Dental Surgeons.

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

Address. C. A. KENNEDY, D.D.S., 2 College Street, Toronto.

CLEANING FILES.—Clogged files can be cleaned with ether, with benzine, or with spirits of turpentine and a stiff brush.

RELIEVING PAIN AFTER EXTRACTION.—An excellent remedy for pain after extraction consists of swabbing out the socket with pure lysol.—P. A. Ash, Commonwealth D. J.

TO SEPARATE PLASTER MODELS WITHOUT SEPARATING MEDIA.—Immediately after taking impression from mouth, immerse in cold water from five minutes to whenever wanted. Pour in usual way without using any separating media whatever, and you will find that the model will not adhere to the impression, but come away clean.—John Mills, D.D.S., Toronto.

SOFTENING RUBBER BEFORE PACKING A PLATE.—Copper screening, such as may be obtained in any hardware store, makes the best support for softening rubber over steaming water while packing flask.—C. H. Mill, *Digest*.

GUM CAMPHOR FOR ADAPTING INLAY MATRICES.—Gum camphor, packed into the partly adapted inlay matrix, serves to swage the metal to a close adaption, and when burned out leaves no residue.—C. H. Neill, *Digest*.

REMOVAL OF AMALGAM FILLINGS.—Hold a heated instrument on the filling until the heat is felt in the tooth. Burr out at once, when it can be cut like cheese. Use an instrument having a very slender shank with a bulbous end, one of the old "Wood's metal" fillers of forty years ago. The slender shank prevents the heat from radiating too rapidly.—A. H. Brockaway, *Digest*.

TO REMOVE STEELE FACINGS FROM BRIDGE.—Immerse bridge in hydrochloric acid over night, when the facings may be removed by the fingers, the acid dissolving the cement media completely.—W. H. Doherty, Toronto.

RENDERING CORK STOPPERS IMPERMEABLE.—In order to render cork stoppers impermeable to alcohol and acids, they are dipped in a cold solution of rubber in chloroform and allowed to dry in the air until the chloroform has evaporated. Another method consists in dipping the cork into very hot, though not boiling, paraffin for about five minutes and allowing it to dry thoroughly.—*Cosmos*.

AID IN TAKING AN IMPRESSION FOR A BRIDGE.—Cases often present in which difficulty is encountered in taking an impression for a bridge. If milk of magnesia is painted over the parts to be reproduced the impression may be taken out without any discomfort to the patient or trouble to the operator.—L. Kohn, Odontologist.

PAINLESS EXCAVATING.—Inject a dosage of novocain right at the very apex of the tooth, producing after a few moments perfect anesthesia of the nerve fibre. For the extraction of the live pulp it is most valuable.—C. A. K.

CLEANING BURS.—An old, worn-out lathe brush, carefully cleansed and trimmed, is much better for cleaning burs than the wire brushes generally used. The latter are too small, soon get out of order, and quickly blunt the burs.—H. J. Morris, *Review*.

PRESERVING HYDROGEN DIOXID.—To preserve hydrogen dioxid, the manufacturers usually add a little sulfuric acid. If this acid is neutralized by a little alkali before use the most is made of the dioxid.—T. S. Dixon, Commonwealth D. J.

A QUICK POLISH.—Oxid of tin, if applied with a leather disk on the engine, immediately produces a fine polish on gold, porcelain or vulcanite, rendering it unnecessary to use the laboratory lathe.—G. A. Wilson, *Journal Allied Societies*.

A GOOD TEMPORARY FILLING.—Gutta percha is not very cheap, and sometimes large temporary fillings are required only for a day or two; also gutta percha is sometimes troublesome to remove when one is busy. An excellent substitute is to be found in wool or cellulose wadding with a drop or two of wax on it. This sets sufficiently hard, is easy to remove, and does not become putrid. It is easily packed in the cavity and smoothed with a warm burnisher.—H. J. Morris, *D. Record*.

ORAL HEALTH.

EDITOR — — WALLACE SECCOMBE, D.D.S., TORONTO, ONT.

ASSOCIATE EDITORS { GEORGE K. THOMSON, D.D.S., HALIFAX, N.S.
W. H. DOHERTY, D. D. S., TORONTO, ONT.

A Monthly Journal devoted to the interests of the Dental Profession, and to the furtherance of Public Health through the education of the Public in relation to Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

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Vol. 2

TORONTO, MARCH, 1912.

NO. 3

EDITORIAL.

DENTAL DEALERS AND DENTAL LITERATURE.

IN the last issue of "Oral Health" reference was made to the fact that most dental magazines are largely controlled by dental manufacturers or dealers.

While we believe such control is at variance with the best interests of the profession, yet we are free to admit that this condition has not been an unmixed evil. There are a few notable exceptions where magazines so controlled have been a positive influence for good, scientifically and professionally.

Notwithstanding these exceptional cases the principle remains that the magazines ought to be free from the dealers' control, and no doubt the time is not far distant when at least the official organs of the profession will be entirely independent of dental manufacturers or dealers.

* * * * *

Under present conditions certain powerful manufacturers get together, form a "Club," and, among other things, decide upon a "favored list" of magazines. The members of the "Club" make a rule of advertizing only in the magazines "on the list." Needless to say, this list comprises the magazines owned by these certain manufacturers, plus the magazines fathered or controlled by the local dental dealer who handles the goods of the "Club" members.

The result has been to discourage independent dental magazines and to drive the struggling "independent" into the open arms of the dental dealer who controls the local "advertising patronage" of these manufacturers.

Canada is not free from the conditions which prevail with few exceptions throughout the United States. We understand that the Temple-Pattison Company has a working arrangement with the "Dominion Dental Journal" to the financial advantage of the former, whereby the Temple-Pattison Company looks after the advertising contracts. The manufacturers naturally place upon the "favored list" the magazine in which their local dealer is interested.

This system of a "favored list" savors of "a combination in restraint," etc., etc., and is one of those abuses that goes far in bringing censure upon the so-called "Trusts."

ORAL HYGIENE AMONG THE POOR.

IT has been reported that a tramp, arrested for having "no visible means of support," upon being searched, was found to have in his possession a tooth-brush and dentifrice. These were set aside by the police officer, but the prisoner immediately pleaded that he be allowed to retain possession of his tooth-brush and tooth-powder, that he might use them during his incarceration. The man had a perfect set of teeth and they seemed to have been given the most careful attention.

The above incident brings to mind what occurred at the recent Christmas celebration of the Children's Aid Society at Toronto. It has been the custom in this institution to give the children a treat in the form of a Christmas tree. Each child is invited to make known its preference in the matter of a Christmas gift from the tree. The result was that out of a total of sixty children, forty *made requests for a tooth-brush.*

Mrs. Duncan, the lady superintendent, has constantly taught the children that clean mouths are essential to good health, and the children have come to believe that if they keep their teeth clean they are not likely to have toothache. The voluntary requests of these children for tooth-brushes proves the great value of oral hygiene work among the young.

These little people, wards in a public institution, in their expressed wish for the wherewithal to cleanse their teeth, put to shame many children of the so-called "better class." Whether these children grow up into good citizens (if they stick to the tooth-brush they likely will) or utterly fail to "lift the load" and remain a permanent charge upon society, this early training will have its good effect. They will be better men and women than they would otherwise have been.

The dental profession must not forget that while the more cultured and better educated citizens need instruction in oral hygiene the poorer people have just as great a need and even more pressing claim upon the profession.

The Oral Hygiene Propaganda is for the poorest in the land as well as the richest. It appeals to the tramp and the street urchin as well as to the more cultured and better educated classes.

Its need is universal.

THE DENTAL SURGEON IN THE ARMY.

DURING the last year efforts have been made to impress the militia authorities with the importance of organizing a dental corps in connection with the Canadian army along the lines suggested in the September (1911) number of "Oral Health."

In fact, recommendations to that effect made by the general officer commanding the 6th Division have been considered by the Militia Department, with the result that it was not considered advisable to make any change in the present regulations, for the reason that the present system works now and would work in the field in a satisfactory manner. This means that the dental surgeon in the Canadian militia must continue to serve his country under regulations which place him in an inferior position or rank to officers of the medical, veterinary and postal corps.

In the United States Army practically the same regulations existed for some years, until the dental profession of the country became aroused to their injustice, and demanded from Congress recognition of the rights of the dental surgeon. The result is that to-day the dental surgeon on appointment in the United States Army receives the rank of 1st Lieutenant, and applicants for this position in the militia of the United States are advised by Emory

A. Bryant to accept nothing less than rank of 1st Lieutenant.

This subject will be discussed at the annual meeting of the Association of Medical Officers of the militia of Canada, of which body the dental surgeons of the militia are members, and further efforts will be made to obtain substantive rank.

We sincerely hope it will not be necessary for the dental profession in Canada to take the same steps as the profession in the United States to obtain recognition of their rights.

We have no doubt, however, that if the regulations governing this matter are not changed before the C. D. A. "meet," in June, that that body will take some decisive and definite action towards the attainment of justice. We feel that a matter of such importance to the uplift of the dental profession should be of interest to every dentist, and would refer our readers to the April (1911) number of the "Dominion Dental Journal," and the September, October (1911) and January (1912) numbers of "Oral Health."

SUGGESTED POST-GRADUATE COURSE.

IT is being strongly urged in "Dental Practice" that following the very successful Practitioners' Course, given at the Royal College of Dental Surgeons last summer, the Board should this year give a special course on Orthodontia.

The great majority of the profession have had little or no opportunity of making a study of this most important branch of dental practice, except from the text books and the journals. There is a growing demand on the part of the laity for advice and treatment in connection with irregularities of the teeth. The Rhinologist is recognizing that correction of the irregular teeth and deformed dental arch is in many cases absolutely necessary for the correction of mouth-breathing, in addition to the removal of the nasal obstruction.

Many members of the profession would be glad of an opportunity of studying this subject either as an equipment for future practice or to enable them to make a proper diagnosis and give proper advice as to treatment elsewhere.

Dr. J. Low Young of New York recently read a paper before the Toronto Dental Society urging the importance of a normal reproduction of the occlusal surfaces of the teeth and cited cases where a failure to do so was responsible for a very serious irregularity developing. Orthodontia has sometimes been termed the science of occlusion. It is impossible to understand either occlusion or articulation without a thorough knowledge of the anatomy of the teeth.

If a course on Orthodontia should be given it should include a course on Dental Anatomy. This subject underlies not only the successful practise of Orthodontia, but also every other phase of dental practice. "Contour, contact and occlusion" are the vital points of every operative procedure. Each demands a thorough knowledge of the anatomy of the teeth and the dental arch. It is doubtful if there is anything that would improve the practice of the profession more than a better knowledge of this subject applied to operations in the mouth.

A post-graduate course including these two subjects should prove of exceptional interest and of value in every phase of dental practice.

GOOD WORK IN BERLIN.

THE members of the dental profession in Berlin are forming a society and are vigorously taking up the work of dental inspection and instruction in the schools. A newspaper report says:—

" Dr. Koepfel appeared before the board and asked that permission be granted him to inspect the teeth of the pupils in the various schools. He explained that many diseases that cannot be accounted for by parents, can often be traced back to the teeth. After some discussion as to the merits of such inspection, when it was pointed out that such a system was being carried on with beneficial results in other schools, he was given permission to inspect several classes and report at the next meeting of the Board. The doctor proposes to deliver addresses illustrated by stereopticon views and charts."

This is a work which can be done in every community where one or more members of the profession are located. The cause of present mouth conditions among school children is neglect. The neglect is due mostly to lack of knowledge of its disastrous consequences. The spreading of knowledge regarding the teeth and their vital importance to good health and good citizenship is a work abundantly worthy to rank with, and indeed inseparably linked with, the efforts toward the betterment of public health by campaigns for good water, better sanitation, better housing, the anti-tuberculosis campaign, etc., etc.

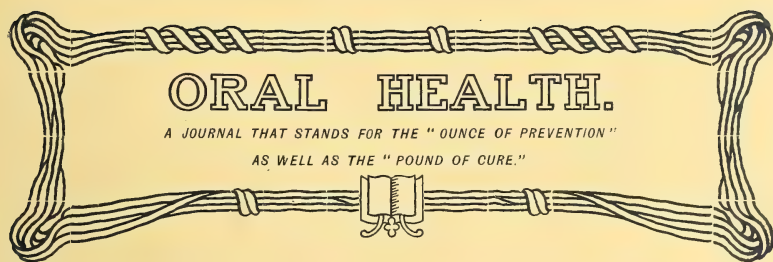
It is gratifying to find the movement for medical inspection of schools, which is bound to come ultimately in every community, initiated in many cases by the dental profession's efforts toward better mouth conditions.

APRIL

The month that most truly
symbolizes human life;
rain and sunshine,
tears and
smiles.



C. N. JOHNSON, M.A., D.D.S., Chicago
(Editor of Dental Review)



Vol. 2

TORONTO, APRIL, 1912.

No. 4.

SOME OBSERVATIONS ON THE CLINICAL EXAMINATION OF SALIVA WITH SPECIAL REFERENCE TO ITS SULPHOCYANIDE CONTENT.

BY H. S. RAPER, D.Sc., M.B., CH.B.

(From the Dept. of Physiological Chemistry, the Royal College of
Dental Surgeons, Toronto.)

AT the present time, signs are not wanting which indicate that the members of the dental profession in every country are turning seriously to the question of preventive dentistry. A lively interest is being taken in the problems of the bacteriology of the mouth and no less is the subject of the relation of the saliva to the production of dental diseases being discussed.

It is obvious if this welcome attention that is being devoted to preventive dentistry is to come to fruition, it must be based on accurate scientific observation and logical deduction. The history of any of the sciences shows, that although haphazard observations have often contained the germ of great discoveries, they have but rarely produced any great advancement of knowledge without accompanying careful and studied investigation and extension. We must, therefore, be prepared for many years of painstaking work, often without much appearance of progress, and, more often than not, with the sacrifice of pet theories and preconceived notions, if

any solid structure of knowledge is to be obtained on which measures for the prevention of the commoner dental diseases can be based.

It is not too much to hope then, that when we know more about the influence of the various conditions present in the mouth—whether referring to the saliva or to the oral bacteria—on the inception and prolongation of dental disease, it will be the business of every dentist to make a clinical examination of the saliva when a new patient presents himself for treatment.

It is quite easy, as anyone can determine for himself, to collect 20 to 30 c.c. of saliva in fifteen minutes by chewing a piece of ordinary soft paraffin wax. Such an amount would probably be ample for determining any variation in its characters and composition, and for a bacteriological examination.

At present we know little or nothing at all of the variation, if any, in the composition of human saliva at different times during the day. This is a matter requiring full and complete investigation before any deductions can be drawn from the analysis of any chance specimen of saliva taken from a patient when he presents himself at the dentist's office. Also, not much is known with regard to the variation in composition of saliva produced by stimulating secretion by mastication, such as occurs when wax is chewed. Since mastication increases the flow of saliva two to three-fold, it is conceivable that the chemical examination of saliva so collected would yield abnormal results due to the rapid flow.

Some interesting observations on this point have recently been carried out by Ewing (*Jour. of Pharmacology and Therapeutics*, Vol. III, p. 1), who determined the variation in the total inorganic and organic solids of saliva as well as the variations in the amount of ptyalin, when salivary secretion was stimulated by pilocarpine. The method was briefly this: The subject chewed soft paraffine for fifteen minutes and collected the saliva. This specimen was used as a control. Pilocarpine was then administered and the chewing continued for three or four successive fifteen minute periods. The effect of the drug soon became evident by the increased secretion. By analysis of the saliva collected in the separate periods the alteration in the relative amounts of the different constituents could be followed. As a result it was shown that the more rapid secretion under the influence of pilocarpine produced a diminution in the percentage of ptyalin, but an increase in its absolute amount. The percentage of organic and inorganic solids, on the other hand, was slightly increased and their absolute amount markedly increased.

The main criticism of these experiments from the point of view of the collection of saliva for clinical examination is that in the central period before the pilocarpine had been given, the secretion

of saliva was already artificially stimulated by chewing wax. I thought it might be of interest to make some observations on the composition of saliva secreted under ordinary conditions and during periods of mastication. The amount of sulphocyanides and the degree of alkalinity of the saliva are easily estimated, and it was decided to compare these in the saliva secreted under the two conditions. The methods of estimation are given later. The saliva was collected shortly after a light lunch, the mouth being well rinsed with water previous to the collection. Four samples were collected in successive ten minute periods, two during periods of mastication, when paraffine was chewed, and two without mastication. The following results were obtained:

Series	Ten minute period	Mastication or Quiescence	Amount Collected in C.C	Alkalinity	Sulphocyanides parts per 100,000
A. (H.S.R)	1	Masticat'n	45	20.0	5.2
	2	Quiescence	20	19.7	7.2
	3	Masticat'n	46	23.0	5.2
	4	Quiescence	17	19.5	7.6
B. (F.M.)	1	Masticat'n	23	24.2	1.6
	2	Quiescence	9.5	25.8	2.3
	3	Masticat'n	22	25.9	1.7
	4	Quiescence	13	23.8	2.0

The marked stimulation of secretion by mastication is well shown. The alkalinity is slightly increased by mastication in my own case, but not in the case of F. M.

The amount of sulphocyanide is relatively diminished. It follows that the saliva collected during a dental operation, for instance, when the secretion is more rapid owing to the mechanical stimulation in the mouth, would give low results as far as the sulphocyanides are concerned. This was confirmed by examining the saliva from a patient at the Infirmary of the Royal College of Dental Surgeons, kindly obtained for me by Dr. A. A. Stewart, to whom my best thanks are due.

The case was one of severe caries and at the time the saliva was being taken for examination in reference to the question of the influence of sulphocyanides in immunity to caries. On the first occasion the saliva was collected during a dental operation by interposing a bottle, with inlet and outlet tube, between the syphon and the waste pipe. On the other occasions it was expectorated.

Date	Feb. 24th, 1911	Mar. 6th	Mar. 17th	Apr. 5th
Sulphocyanides per 100 000 of Saliva	0.0	2.4	1.2	2.0

On Feb. 24th when the saliva was collected by the syphon 67 c.c. were obtained in twenty-five minutes. On the other days the secretion was much less.

The influence of the sulphocyanides in saliva on immunity to dental caries is being widely discussed at present and it may be opportune to present here some results obtained in the examination of saliva from twenty-four cases. Most of these were students at the Royal College of Dental Surgeons where the estimation of sulphocyanides in the saliva is included in the practical course in physiological chemistry.

The determinations were made under my supervision, and are reasonably accurate. In four cases, classified as "very susceptible," the saliva was kindly obtained for me by Dr. A. A. Stewart. They were patients with marked caries who were attending the Infirmary for treatment. The cases classified as "susceptible" had required the insertion of fillings within a year of examination. The "non-susceptible" cases had not required fillings for several years.

Class of Cases	Number of Cases Examined	Sulphocyanides per 100,000 of Saliva Average	Sulphocyanides per 100,000 of Saliva Variation
Very Susceptible	4	2.9	1.6 to 6.4
Susceptible	13	3.4	1.2 to 5.5
Non-Susceptible	7	3.7	2.4 to 5.2

The number of cases is not great enough to draw any conclusions from the average figures obtained, and the wide variations in each group render these still more unreliable. Certainly no striking differences have been obtained such as one would be led to expect from the accounts of previous observers.

One point with regard to the question of sulphocyanides and immunity to caries has not been sufficiently considered. Even if the sulphocyanides be diminished in cases of dental caries, is it not just as logical to assume that the diminution is due to the disturb-

ance of general health and the normal metabolic processes, produced by the continued swallowing of toxic substances from the carious teeth, as that it is the cause of caries? In other words it might be merely a secondary symptom and not the primary cause. At all events the question is not sufficiently decided to warrant the administration of sulphocyanides to persons suffering from dental caries.

Another point of interest with regard to the sulphocyanide content of saliva has been investigated, namely, the action of oral bacteria on sulphocyanides. It is conceivable that the sulphocyanides in saliva might be destroyed by the bacteria found in the foul saliva of persons suffering from widespread caries, and thus a diminution in amount, which has been noted in some cases be accounted for. This was found not to be the case.

A sample of my own saliva containing 5.6 parts of sulphocyanide per 100,000 was inoculated with 0.1 c.c. of saliva containing only a trace of sulphocyanides, from a patient with marked caries. After incubation for 24 hours at the body temperature the sulphocyanide content was again determined and was found to be unchanged, although the saliva was swarming with bacteria and had acquired a very putrid odor. Sulphocyanides, therefore are not destroyed by the oral bacteria.

The methods used for the determination of the "alkalinity" of saliva and its sulphocyanide content, calculated as ammonium sulphocyanide are as follows:

ALKALINITY.

10 c.c. of saliva are measured into a small flask with a pipette, one drop of a 1% solution of methyl orange added and titrated with decinormal sulphuric acid until the color just changes to orange. The amount of sulphuric acid required multiplied by ten is the figure I have used to express the "alkalinity" of the saliva. It represents the volume of acid required to neutralize 100 c.c. of saliva using methyl orange as indicator. This indicator is chosen because the alkalinity of saliva is largely due to bicarbonates.

SULPHOCYANIDES.

The following method is convenient, though only approximately accurate. Three reagents are required. (1) A 10% solution of ferric chloride. (2) A 1% solution of hydrochloric acid. (3) A standard solution of ammonium sulphocyanide in distilled water, containing 0.40 grammes of NH_4CNS per litre. 1 c.c. = 0.0004 gms. NH_4CNS .

Two test tubes of equal diameter are taken, which for convenience I will call A and B. In an ordinary test tube is placed 5 c.c. of saliva, 1 c.c. ferric chloride, 1 c.c. hydrochloric acid and 3 c.c. water. The mixture is then filtered through a small dry filter paper into tube A. In tube B is placed 1 c.c. ferric chloride, 1 c.c. hydrochloric acid and 8 c.c. water. The standard ammonium sulphocyanide solution is then added drop by drop from a burette until the red color it produces is of the same depth as that produced by the saliva in tube A. The mixtures in the two tubes must then contain the same concentration of sulphocyanide. The result is calculated as follows:

Suppose 0.63 c.c. of the standard sulphocyanide solution was used in matching the saliva.

Then the weight of ammonium sulphocyanide added $= 0.63 \times 0.0004$
 $= 0.000252$ gms.

This is present in 10.63 c.c. of fluid, therefore the concentration is

$$\begin{array}{rcc} 0.000252 & & 0.000237 \\ \hline & \text{or} & \\ 10.63 & & 10 \\ \hline & = 2.37 \text{ parts per } 100,000 \end{array}$$

Since the saliva giving the same color was diluted with its own volume of fluid the concentration in the original saliva is 2×2.37 or 4.74 parts per 100,000.

It is hoped an opportunity offers to continue the investigation of the variations in the composition of normal saliva under different conditions, thereby hoping to obtain some basis on which deductions can be drawn from the examination of the saliva of persons suffering from dental caries.

(1) OUT of two million school children examined last year in England, 10 per cent. had defective eyesight, 3 to 5 per cent. defective hearing, 8 per cent. adenoids or enlarged tonsils, and 20 to 40 per cent. defective teeth. The dental examination in most cases being made by a medical man, the percentage is comparatively low.

APPEAL IN TAGGART CASE.

IN our last issue we published an account of the court's decision in the Taggart-Boynton suit. It now appears from the following correspondence that the case is to be taken to a higher court.

Washington, D.C., February 10th, 1912.

Dr. George W. Boynton yesterday noted an appeal to the Court of Appeals in the Taggart case, and filed a supersedeas band required by the rules of the Court.

The Court has issued no injunction or restraining order restraining Dr. Boynton or any other dentist from practising the inlay process upon which he was sued, nor can any such order be issued until the final hearing of the case before the Court of Appeals. It will be at least three or four months before this case will be heard by the Court of Appeals and finally decided.

As both sides to this controversy had stated to the Court that an appeal would be taken if the decision were adverse, the lower court did not consider it necessary in its decision to go into the question of the evidence taken by both sides, but simply announced from the bench that he had decided in favor of sustaining the patent.

FRED B. RHODES, *Attorney for Defendant.*

BRODIE MEMORIAL FUND.

RECENT donations to this fund are as follows:

W. A. Black	\$1.00
A. J. McDonagh	2.00
F. D. Price	1.00
W. E. Cummer.....	2.00
G. W. Grieves.....	2.00
Edgar W. Paul	2.00
A. D. Mason	1.00
W. H. Doherty	1.00

THE President of the Ottawa Dental Society, Dr. Juvet, has presented a report to the House Committee of the Protestant General Hospital, Ottawa, containing suggestions for the improvement of the dental clinic in that institution.

MOUTH HYGIENE EXHIBIT.

THE illustrations which follow are small reproductions of the cards for teaching mouth hygiene, prepared by Dr. W. H. Doherty of the Department of Medical Inspection, Board of Education, Toronto. A full set of these cards, each of which is 22 x 28 inches, with some others yet to be added, is being placed in every public school in Toronto, where it is expected it will be used by the teachers, school nurses and dental inspector in arousing a proper recognition of the importance of cleanliness of the mouth.

By courtesy of the Board and Chief Medical Inspector, the Educational Committee of the Ontario Dental Society has been permitted to make copies. The Educational Committee will send a complete set to every local committee in the province.

Other bodies or persons wishing to obtain a set may do so by paying the actual cost of production.

The Chief Health Officer of the Province, Dr. J. W. S. McCullough, obtained copies from the Board of Education, and these cards now form part of the Provincial Health Exhibit which is touring the province.

Communications regarding the copies which can be obtained from the Ontario Educational Committee should be addressed to the secretary, Dr. R. J. Reade, 2 Bloor Street W., Toronto.

CHILDREN'S DISEASES

OCCUR AS A RULE JUST AT THE PERIOD OF GREATEST

Neglect of the Mouth,

that is, while the first teeth should be in place or are being replaced by the second teeth. A CHILD WITH AN UNCARED-FOR MOUTH IS

INVITING THESE DISEASES

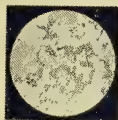
and is also a menace to other children. GUARD THE GATEWAY OF THE BODY-THE MOUTH, and so

PROTECT THE CHILD

DECAY OF THE TEETH!

Decay is Produced by Bacteria!

Bacteria of
Tooth Decay



Very Much
Enlarged

These bacteria become attached to the tooth at each unclean spot. This accumulation of food particles, saliva, bacteria, &c., stuck to the tooth, is called a Plaque. The bacteria in the Plaque produce an acid which is held against the tooth at this spot, forming a cavity. These bacteria thrive on food containing starch and sugar.

**A Perfectly Clean Tooth
Will Not Decay!**

NOTE: IN THE PREVENTION OF DENTAL DECAY, THE USE OF BACTERICIDAL TOOTH PASTE IS ESSENTIAL.

TO PREVENT DECAY

"DENTAL DECAY IS ONE OF THE MOST EASILY AND CERTAINLY PREVENTABLE OF DISEASES."

Thorough mastication of coarse foods polishes the teeth and stimulates the gums.

Avoid an excess of soft, starchy, sugary food.

Proper use of the toothbrush.

Regular visit to the family dentist.

**The Best Preventives
ARE**

USE AND CLEANLINESS

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FOOD & TOOTH DECAY

**FOODS WHICH ARE
NOT CLEANSING & PRODUCE DECAY.**

STARCHY AND SUGARY FOODS
WITHOUT FIBROUS ELEMENT.

EXAMPLES:

Sweet Biscuits & Cake, Bread & Marmalade,
Bread & Jam, New Bread without crust,
Bread soaked in Milk, Milk Puddings,
Porridge & Milk, Stewed Fruit, Honey &
Sweets of all kinds, Cocoa & Chocolate.

WHEN THE ABOVE ARE EATEN

**CLEANSING FOODS
SHOULD FOLLOW!**

PREPARED BY THE BOARD OF MODERN TOOTHBRUSH, 1251 1/2 ST. MARGARET, VANCOUVER

FOOD & TOOTH DECAY

**FOODS WHICH ARE
CLEANSING & PREVENT DECAY.**

FIBROUS FOODS GENERALLY.

EXAMPLES:

Fish, Meat, Poultry, Lettuce, Cress, Radish,
Celery, Uncooked Vegetables (Cooked Vegetables
are as a rule cleansing but in less degree than the uncooked),
Stale Bread with Crust, Twice Baked and
Toasted Bread of all kinds, Savouries, Fresh
Fruits, Fatty Foods of all kinds, Soups, &c.

**COARSE AND FIBROUS FOOD
IS A**

NATURAL TOOTHBRUSH!

PREPARED BY THE BOARD OF MODERN TOOTHBRUSH, 1251 1/2 ST. MARGARET, VANCOUVER

THE TOOTHBRUSH

MOST BRUSHES ARE TOO LARGE!

A large brush will not reach all the surfaces of all the teeth, nor will it permit the freedom of movement necessary to clean them.

TOOTHBRUSHES—Actual Size



Adult's Brush
Head too broad, bristles too



Child's Brush
Head too broad, bristles too



Lingual Tooth Brush

BEST RESULTS ARE OBTAINED

BY

A SMALL TOOTHBRUSH

AND

VIGOROUS MOVEMENT.

MADE BY THE INTERNATIONAL TOOTHBRUSH MANUFACTURERS ASSOCIATION
111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999

THE TOOTHBRUSH

Decay most frequently begins between the teeth and on the uneven grinding surfaces.

A solid mass of bristles does not reach these spots.



Face view



Face view



Side view



Side view

Adult's Brush enlarged Child's Brush

The tufts are well separated and pointed, so as to cleanse between the teeth and the uneven grinding surfaces.

For Surfaces
Difficult To Reach



Lingual Tooth Brush

Use
This Brush.

WELL SEPARATED TUFTS MAKE A SANITARY BRUSH.

MADE BY THE INTERNATIONAL TOOTHBRUSH MANUFACTURERS ASSOCIATION
111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999

BRUSHING THE TEETH.

CARD 1.

Place the side of the brush, bristles up, flat on the upper gum, as high up as possible.
(Position 1.)



POSITION 1.



POSITION 2.

By turning the wrist, rotate the bristles downward over the upper gum and teeth, clear of the lower teeth and gum until the brush lies, bristles down, flat on the lower gum, as low down as possible.
(Position 2.)

Illustration by the Dental Department of the United States Army, and the Dental Department of the United States Navy.

BRUSHING THE TEETH.

CARD 2.

From Position 2, with a reverse turn of the wrist, rotate the bristles upward over the lower gum and teeth, clear of the upper teeth and gum, to Position 1 again.



POSITION 2.



POSITION 1.

Repeat these movements as often as necessary, on the outer surfaces of all the teeth, both front and back.

Illustration by the Dental Department of the United States Army, and the Dental Department of the United States Navy.

BRUSHING THE TEETH.

CARD 3.

The inner surfaces should be brushed as carefully as the outer surfaces.



Brush the Upper Teeth Downward and the Lower Teeth Upward.

Brush the uneven grinding surfaces vigorously in all directions.

Illustrations are the property of the U.S. Government and are not to be used in any other work without permission of the U.S. Government.

BRUSHING THE TEETH.

CARD 4.

Brush first using a dentifrice, then with an abundance of water.



Rinse the mouth thoroughly with water after brushing.

A dentifrice is used only to assist in cleansing the teeth.

Water is the only mouthwash needed for general use.

NO DENTIFRICE OR MOUTHWASH WILL DESTROY THE BACTERIA OF DECAY.

Illustrations are the property of the U.S. Government and are not to be used in any other work without permission of the U.S. Government.

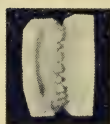
FIRST TEETH!

WHY PRESERVE THEM?

THE FIRST TEETH



Note Teeth
Close
Together



Spaces
Show
Growth of
Jaw

AT 6 YEARS

AT 16 YEARS

THIS GROWTH OF THE JAWS

DEPENDS UPON THE

PRESERVATION AND USE OF

THE FIRST TEETH

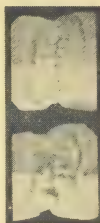
It is necessary for the proper development of the face and to make space for the larger Second Teeth and so

Prevent Irregularities

THE DENTAL CRIPPLE

A DENTAL CRIPPLE

THE RESULT OF
DECAY and LOSS of the FIRST TEETH



Note
Undersized
Upper Jaw

Shows
Teeth After
Correction

The UPPER jaw did not develop to proper size owing to loss of the upper first teeth. The UPPER teeth bite INSIDE the LOWER allowing the UPPER lip to fall in. (Fig. 1)



The
Result
Features
Deformed

Teeth
Corrected
Features
Restored

Save the First Teeth!

THE "SIX-YEAR MOLARS."

CARD 1.

They Belong to the Second Set.

These four molars come at six years, one on each side of the upper and lower jaws, just back of the last tooth of the First Set.

They are usually mistaken for teeth of the First Set.

The baby's first tooth is eagerly looked for. IT IS MORE IMPORTANT TO LOOK FOR THE FIRST OF THE SECOND SET. THE "SIX-YEAR MOLARS."

Illustration of the eruption of the six-year molars.

THE "SIX-YEAR MOLARS."

CARD 2.

Some Effects of their Loss.

In the illustration the lower first (or "six-year") molar has been lost.



NOTE THE TIPPING FORWARD OF THE

LOWER MOLARS MARKED 2 & 3.

THE SECOND SET

This tipping forward of the lower molars, 2 and 3, has forced all the upper teeth forward, causing the upper front teeth to project from the mouth.

Illustration of the protrusion of the upper teeth, caused by the loss of the lower first molar.

AN UNCLEAN MOUTH

Contains

Cavities and pockets holding FERMENTING REFUSE from previous meals

DEAD and POISONOUS remains of pulps ("nerves") of decayed teeth

PUS from ABSCESSES and Diseased Gums
BACTERIA OF MANY DISEASES

Each mouthful of food carries this infection into the stomach

THE MOUTH IS THE GATEWAY
OF THE BODY

KEEP IT CLEAN!

Prepared by the American Dental Association, 500 North Dearborn Street, Chicago, Ill.

"GUM BOILS!"

An abscess or "gum boil" is caused by poisons from the dead 'NERVE' or PULP of a neglected tooth.

THEY PRODUCE PUS **Continuously!**

As many as 6 abscesses are frequently found in a child's mouth due to the common neglect of the FIRST TEETH.

PUS IS A DEADLY POISON!

Indigestion, Anaemia, Lowered Vitality, and even death frequently result from continual swallowing of PUS from these

"PUS FACTORIES."

Prepared by the American Dental Association, 500 North Dearborn Street, Chicago, Ill.

DECAYED TEETH MAY CAUSE TUBERCULOSIS!

Inability to properly masticate, and the continual swallowing of Pus, Bacteria, and Fermenting Refuse held in the cavities in the teeth, cause

LOWERED VITALITY.

THE GERMS MAY ENTER THE GLANDS OF THE NECK THROUGH DECAYED AND ABSESSED TEETH, PRODUCING

TUBERCULAR GLANDS.

THEY ARE THE CAUSE OF TUBERCULOSIS, AND THE SOURCE OF THE TUBERCLE BACILLI, WHICH ARE THE CAUSE OF THE DISEASE. THEY ARE FOUND IN THE MOUTH OF THE SUFFERER, AND IN THE MOUTH OF THE MEDICAL SUBSCRIBER.



BAD TEETH - ILL HEALTH

Most disease germs enter the body through the mouth.

Over 20 varieties of disease germs have been found in the mouth including those of

DIPHTHERIA	TUBERCULOSIS
PNEUMONIA	INFLUENZA
TYPHOID, &c.	

A CLEAN HEALTHY MOUTH

 IS THE BEST 

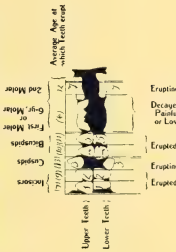
INSURANCE AGAINST DISEASE

THEY ARE THE CAUSE OF TUBERCULOSIS, AND THE SOURCE OF THE TUBERCLE BACILLI, WHICH ARE THE CAUSE OF THE DISEASE. THEY ARE FOUND IN THE MOUTH OF THE SUFFERER, AND IN THE MOUTH OF THE MEDICAL SUBSCRIBER.

RESULTS OF NEGLECT!

WANT OF MASTICATING POWER

In a neglected mouth at 12 years.
SHOWS ONE SIDE OF THE MOUTH ONLY



The large decayed tooth is one of the "6-year molars" usually mistaken for first teeth and allowed to decay.

These four large teeth are provided, at 6 years, just back of the first teeth, as an aid in mastication, while the first teeth are gradually being replaced.

INABILITY TO MASTICATE
RETARDS
PHYSICAL AND MENTAL DEVELOPMENT.

FIGURE 1. THE EFFECT OF NEGLECTED TEETH.
BY COURTESY OF BUREAU OF EDUCATION, UNITED STATES DEPARTMENT OF EDUCATION

EFFECT OF DECAYED TEETH

ON PROGRESS IN SCHOOL!

Decayed Teeth and an Unclean Mouth

RESULT IN



PAIN PUS

INATTENTION

BOLTED FOOD

MALNUTRITION

INDIGESTION

EYE-STRAIN

DISEASE

THESE PHYSICAL HANDICAPS CAUSE

RETARDED
MENTAL DEVELOPMENT

FIGURE 2. THE EFFECT OF DECAYED TEETH.
BY COURTESY OF BUREAU OF EDUCATION, UNITED STATES DEPARTMENT OF EDUCATION

EFFECT OF DECAYED TEETH

ON

PROGRESS IN SCHOOL!



"Two decayed teeth will keep a child back six months or more in the school course."

"Mouth-breathing will keep a child back a year or more."

THE WORSE THE TEETH

THE WORSE THE SCHOOL STANDING

THE UNIVERSITY OF CHICAGO PRESS, CHICAGO, ILL.

A CLEAN MOUTH

What it means to the Child

Thorough MASTICATION, Proper NUTRITION,
Physical & Mental DEVELOPMENT.

Freedom from TOOTHACHE and the resulting
EYE STRAIN and NERVOUS DISTURBANCES
FACIAL HARMONY, the result of CLEAN,
SOUND, REGULAR TEETH



A Barrier
Against
Disease Germs

Increased
Self-Respect

Pure Food Enters a Pure Mouth
More Rapid Progress in School

'A MOUTH as CLEAN as the FACE'

THE UNIVERSITY OF CHICAGO PRESS, CHICAGO, ILL.

DENTISTRY IN THE HOSPITAL FOR SICK CHILDREN, TORONTO.

J. A. BOTHWELL, D.D.S., I.D.S.

THE installing of a clinic is by no means an easy task, and only those who have attempted the organization of a new department realize the amount of detail to be worked out.

One must consider, first, the class of work, in this case limited to the examination, treatment, and filling of teeth of children under thirteen years of age.

Secondly, the amount of work to be done. The number of patients in the hospital at one time is about 130; the average number admitted per day being about 3.

When one considers the length of time required to do one little operation in dentistry and the number of patients needing attention, one soon realizes the amount of work entailed in handling so many.

The equipment is of the most modern type, part of it being specially constructed for hospital purposes. The room is finished in light cream with equipment in white enamel. The engine was made specially to order of portable type, so that it may be used conveniently in the wards and at the same time be suitable for clinic work at the chair. This is accomplished by a compensating all-cord attachment, that allows the cable to be raised to the height of a man's head and lowered to that of a cot, without changing the belt. The controller has a handle and a means is provided on the motor-stand for conveniently carrying the engine from place to place. This is particularly necessary, for when you need an engine in the ward, you need it badly.



DR. J. A. BOTHWELL.

The chair is very complete, and includes a child's seat and compensating back. All adjustments have automatic locks, so that each movement or change of position is accomplished quickly and securely. The back and head rest-slides respond immediately to the finger levers provided. The child's seat when not in use folds out of sight into the back. The upholstery is of green fancy hair-cloth, which is clean, durable, and of nice appearance.

When operating in the ward the side of the cot can be taken off or lowered to the floor, so that the operator may sit on the bed.

At the head of each cot, and attached to it by a double clamp, is a tooth-brush holder—one end of clamp is attached to the bed and the other to the holder. This holder is made of thin steel in two parts, a top and body—the top fitting over the body in the form of a sleeve. The holder is round with rounded ends, perforated so that air may freely pass through. The holders are tin on the inside and nickle on the outside to prevent rusting, and are made in this manner so that they may be easily sterilized, and have absolutely nothing to get out of order.

Each child on entering the hospital is examined and given a Hutax tooth-brush, which is kept in the holder on each child's own bed. The nurse has instructions to do the rest.

One of the greatest difficulties in organization was the arranging of the chart. As each patient must have a chart, and all do not need to visit the clinic, it was necessary to have an examination chart and a work chart combined.

The left side is a working side,—under the head "Fillings," columns A and C represent amalgam and cement; under "Root Treatments," D is for dressing, T F for temporary filling; "Routine Treatment" refers to the instructions given to the nurses in lecture regarding the care of the mouth; "Special Treatment," when a mouth wash or anything special is required for the patient.

The right side of chart is for the examination, marking of cavities, or of teeth for extraction.

This chart may be improved on, but is being given a year's trial.

THE CARE OF THE MOUTH AND TEETH OF LITTLE CHILDREN.

BY H. B. TILESTON, M.D., D.D.S., LOUISVILLE, KY.

(Read before the Southern Branch of the National Dental Association at Atlanta, Ga., April 4, 1911.)

MUCH has been said and written concerning the care of the permanent teeth, and recently the dental press has teemed with articles on oral hygiene, until the reader almost grows weary of a very good thing.

CARE OF TOOTH DEVELOPMENT IN THE UNBORN.

Not overmuch has been said lately, however, about the care of the mouth and teeth of little children; by that I mean very little children, in whose mouths are only deciduous teeth, or in whom no teeth have as yet made their appearance. I even have in mind, and purpose to speak of the care for rather than of the teeth, of children unborn.

If it may truthfully be said, as someone suggested, that the education of a child should begin with its grandmother, it is certainly no less true, and far more easily demonstrated, that a prudent care for a child's teeth should begin with its mother, and some time previous to its birth.

When it is remembered that the calcification of the teeth of the primary dentition begins at the seventeenth or eighteenth week in the embryo, and that, at birth, the crowns, *i.e.*, that portion of the teeth which will later be subject to the attacks of caries, are practically completed, it will be readily appreciated that it is quite possible for certain influences to make or mar the perfection of the deciduous teeth during the period of gestation. They may be atrophied in their development, particularly the enamel, by a syphilitic taint in either parent, by tuberculosis of the mother, or by an attack of some exanthematous disease during the period of activity of the ameloblasts, or by any illness tending to interrupt the growth of enamel, and by insufficient or improper diet during that time.

CONCERNING DIET DURING PREGNANCY.

The question of diet is the most important one to consider in this

connection, because it is potentially within the control of the prospective mother. In some instances a diet not calculated to supply the needs of a growing tooth is indulged in through ignorance, or possibly from necessity, but it is also undoubtedly true that in many cases the dietary is intentionally perverted under the impression, probably largely based upon superstition—though quite likely not altogether so—that, in order to escape difficult and painful parturition, all bone-forming foods must be avoided. Thus it happens that many pregnant women refrain from eating bread and cereals, such foods as would supply the phosphates necessary to the growth of the bones and of the teeth of the developing fetus.

After the child is born the bones may recover from such impoverishment through the nutrient channels of the babe itself, but at birth the enamel of the deciduous teeth, with the exception of about the gingival third of the second molars, is finished, and the ameloblasts having disappeared, there is no possible chance for any imperfections of development then existing to be remedied.

When these teeth finally make their appearance, inadequately protected by the failure of the calcification centres of the enamel caps to coalesce in the sulci of the molars and at points upon the incisors and canines, it is not surprising that they fall early victims to the ravages of caries.

If this condition is properly referable to incorrect feeding on the part of the mother, it would seem the part of wisdom, in the interest of the future usefulness of the teeth of the infant and their conservation, that some educational work should be undertaken by both the family dentist and the physician to teach mothers what they should eat during the period of gestation in order to supply the essential elements of the developing teeth. Not that they should be encouraged to partake of an undue amount of bone-forming ingesta with the ambition to induce superlative teeth, but that the regimen might be normal as nearly as possible, without thought either of depriving the foetus of calcium phosphate and carbonate or of giving it an excessive supply of these salts.

ADMINISTRATION OF MILK OF MAGNESIA INJURIOUS.

Another possible cause of imperfect calcification of the teeth, both of the deciduous and permanent set, is suggested by a recent publication from the pen of Dr. John Aulde, a physician of Philadelphia, Pa., in which he claims to have observed, in the administration of large and frequent doses of the milk of magnesia, that the magnesium will substitute itself for the calcium in the bones.

This element is prescribed freely by physicians as a corrective in cases of acid excreta by the kidneys, the skin, and the bowels, or

for acid vomiting, and is used *ad libitum* as a home remedy for sour stomach and as an aperient. Dr. Philip F. Barbour of Louisville, an eminent specialist in children's diseases, called my attention to it, and suggested that such substitution might have some effect upon the teeth. He said he had frequently administered it to children and to pregnant women in conditions which he termed "acid storms," when all the excretions were for a time acid, and that since reading Dr. Aulde's article he had made observations which appeared to verify the claims he advanced.

The chalky white atrophic spot so often seen in the enamel of both the deciduous and permanent teeth and the areas devoid of enamel might be accounted for quite reasonably in this manner. If Dr. Rulde's claims are substantiated by further observation, greater circumspection in the use of this apparently harmless substance will be called for.

DIET AND CARE AFTER BIRTH OF THE CHILD.

The moment the child is born it becomes an independent entity as far as its nutrient economy is concerned, and its diet must be looked after either through the food of the mother, if she nurses the child, or by the careful selection of food given directly to it. But then the concern is no longer for the deciduous teeth, but for the permanent ones, which have already begun to calcify, and in which enamel formation will continue for eight years. It is during this period that eruptive diseases are apt to leave their mark upon the enamel, and every dentist has observed the effects of measles or scarlet fever in the markings left upon that tissue.

The teeth have generally been classed as dermal tissues, as distinguished from the osseous, but the enamel, which is developed from the epithelial layer of the blastoderm, is the only part of the tooth which may properly be looked upon as being an appendage of the skin, and it is that portion which is affected by skin diseases when they occur during the period of amelification. It is during this period also that the effects upon the enamel might be expected to accrue from the administration of magnesia referred to above.

LANCING OF THE GUMS.

The operation of lancing the gums in cases of morbid primary dentition was formerly much more generally practiced than it is now. At one time almost every systemic disturbance occurring in the infant between the ages of six months and two years was conveniently attributed by medical practitioners to the process of "teething," and gum lancing as a remedy was indiscriminately resorted to both by physicians and dental specialists.

With the acquirement of more thorough and complete knowledge of infant pathology the pendulum has swung to the other extreme, and at the present time most physicians attach very small importance to difficult dentition as a factor in infantile pathemata. As a consequence, gum-lancing is just now quite out of fashion. Nevertheless, conditions frequently present in cases of retarded eruption of the deciduous teeth which seem to render this operation imperative, and gum-lancing, therefore, ought not to be relegated to the obsolete.

An intelligent appreciation of the conditions as they exist about an erupting tooth within the jaw, the overlying elastic gum tissue forcing the tooth with its circular knife-like incomplete root back upon the highly vascular tissues about its apex, together with the inflamed and sensitive state of the gum itself, suggests at once the use of the lancet to release the imprisoned tooth. The complete relaxation which follows, an infant on the verge of convulsions falling into a peaceful sleep or comfortably resuming its play, affords ample justification for the operation.

CARE OF THE TEETH AFTER ERUPTION. UNTOWARD EFFECTS OF SUGAR AND STARCH.

When the teeth finally make their appearance, then not only the diet of the child, but its habits of mastication and oral hygiene are to be regulated, looking not so much to the development, at least of the deciduous teeth, as to their preservation and proper function.

The question of diet is to be considered in its relations to both tooth development and preservation of the teeth. The milk from a well-nourished mother is conceded to be the food best adapted to supply all the needs of a growing infant. While artificial foods may be sufficiently nourishing, they are almost invariably so excessively charged with sugar that the teeth, after their eruption, if such foods are continued, are sure to suffer, unless extraordinary precautions as to oral proyhplaxis are employed.

Dr. M. Evangeline Jordan of Los Angeles, Cal., in a paper read at the meeting of the National Dental Association in Denver, calls attention to the injury almost invariably inflicted upon the teeth of little children by the use of condensed milk, and cites several cases from practice showing excessive damage from this cause.

The use of sweetened infant foods cultivates a taste for sweets, and the child, as it grows older, develops the proverbial "sugar tooth," a craving for candies and cakes, for syrups and dainty tidbits that exclude from the diet the more nourishing foods, much to the injury of general health and the teeth.

Foods containing sugar are not necessarily destructive to the teeth. It is only when the sugar is allowed to remain upon and between them until changed by the bacteria thriving upon it into lactic acid, that the teeth suffer from caries. Foods containing starch, which is changed to grape sugar, a glucose in the mouth, are just as bad for the teeth, and farinaceous substances are necessarily a part of every mixed dietary. Sugar in the form of confections is worse only because it is eaten at all times, with meals and between them. No direct harm would be done to the teeth in any case if the mouth could be thoroughly cleansed of all traces of sugar or starch immediately after partaking of them; a difficult thing to do when the habit of eating candy is indulged in continuously. For this reason children should be denied the use of candy at all times, and be permitted only a limited quantity of sweets with meals, after which the teeth should be cleansed by the mother or nurse, and, as soon as feasible, by the child itself.

The eruption of the very first deciduous tooth proclaims the time for the beginning of prophylaxis. The prudent mother will care for that little tooth, and clean it and polish it like the precious jewel that it is, and, as others appear, the field of operation will widen until it includes the entire galaxy of gems. A child is as susceptible to the delicious sensation of oral cleanliness as older people are, and if the teeth are kept clean during the time when that duty must be performed by the mother, the work will be continued by the child as soon as it is old enough, and the habit thus begun will continue throughout life. Given a set of teeth free from congenital imperfections, such care as this will certainly preserve them until they are exfoliated to make room for their successors.

Recently I had the pleasure of viewing in the mouth of a little boy four years old a set of teeth so beautiful and perfect that I took impressions of them and made these casts [demonstrating]. Every tooth in both dentures is absolutely free from spot or blemish of any kind. This child has never tasted candy, and his mother and his aunt began cleaning and polishing his teeth as soon as the first incisor appeared, with this most gratifying result.

But, alas, few mothers have either the inclination or the slightest conception of its importance to impel them to perform such service for their little ones, and as a consequence the first view that the dentist has of the majority of the mouths of little children brought to him, usually for the relief of pain, is not only discouraging but disgusting. In a large proportion of instances the parents have never dreamed of such a thing as cleaning their child's teeth.

Most parents, some dentists, and many physicians look upon any special care of or solicitude for deciduous teeth as all but useless,

since, in their opinion, they are to last but a little while anyhow. There is a widespread and utter lack of appreciation of the purposes of the primary set of teeth or of the beautiful arrangement in nature whereby the growing child is provided with a continuous masticating apparatus. Since the teeth themselves cannot increase in size to keep pace with the growing maxillae, a small set is gradually superseded by a larger and stronger one suited to the larger and stronger jaws, and the deciduous teeth are intended to perform all the functions of their permanent successors until displaced by the latter. If the deciduous teeth are preserved in all their integrity, this process of replacement goes on smoothly; but if any are prematurely lost or their approximal contact is destroyed by caries, or if abscesses are allowed to form from putrescent pulps, then all goes wrong.

THE DENTIST'S PROBLEM.

Fully cognizant of the crying need for operative services in the mouths of little children who are entrusted to his care, and as fully aware also of the difficulties attending such service, sometimes almost or quite insurmountable, the dentist is confronted with a serious problem, and he asks himself the question, What shall I do about it? If he fails to direct the attention of the parents to a need he knows to exist in their child's mouth he shirks a known duty; and if he makes a conscientious effort to impress the parents with the importance of caring for such conditions he knows he will be called upon to do it, and in many instances he would prefer not to undertake it. Children who have been spoiled at home or have been taught to look upon a visit to the dentist as a fearful thing are usually hopeless patients, and after having spent a fruitless hour with such a child, the dentist may be pardoned if he fervently hopes never to see that youngster again, and feels that he must hie himself away with his golf clubs and have a foursome or a lonesome, and forget his troubles.

Fortunately such extreme cases are comparatively rare, and will become less frequent as the parents, through the advice and instruction of the family dentist, train their children to value their teeth, and to look upon the dentist as a friend and not a monster to be dreaded. The solution of the problem lies in getting hold of the little ones so early that there is nothing to be done that will cause pain, and then so guarding their development, by frequent visits to the office, together with proper care at home, that no occasion will ever arise for the infliction of any great amount of pain.

While some cases in every practice may be treated in this manner, and while their number may be confidently expected to increase, there still occur numerous cases where the destruction of

the teeth has progressed to a point which all but prohibits any hope of success in the attempt to save them. The complaint is made that the fees obtainable for such service are not commensurate with the time and skill required, not to mention the wear and tear on the nerves and the patient of the operator.

The question which presents itself frequently in a practice among a good class of people, such as most ethical dentists enjoy, is not, What shall I do for poor children's teeth? but, What shall I do for the teeth of children whose parents are willing and anxious to have done whatever I advise, and who are able to pay for it? When it is explained to such parents that the contemplated service, together with the time and skill required to perform it, is worth more to the future of the child than the same amount of care devoted to it in later life will be, they will usually be perfectly willing to pay a satisfactory fee," and quite often the *what* and the *who* constitute another difficult problem. The conscientious practitioner will want to do many things that he cannot do, and will have to be content to do the best he can under the circumstances, realizing that frequently that best is a very poor thing indeed.

AMUSING CHILDREN.

Many suggestions have been made and devices offered for the amusement of children in the dental chair. In children who are shy and timid some means must be adopted to reassure them and gain their confidence before anything can be accomplished, but in my opinion the efforts to amuse them may be carried too far, especially with forward, wilful children who are quite willing to be amused, but are for all that no more ready to submit to the real object of their visit than before; in fact, they rather prefer that the dentist should continue to amuse them.

Objection has been made to the paraphernalia surrounding the modern dental chair as calculated to inspire fear and dread in a child. Intelligent children are usually of an inquiring turn of mind, and a tactful dentist can readily interest them in his various appliances, and in order to illustrate their use will presently be actually using them on the little patient. I think more can be accomplished with little children by a kind, gentle and sympathetic attitude, together with enough firmness and not-too-severe dignity to command their respect, than by any effort to amuse them which may encourage familiarity to the extent of breeding contempt for the real purpose of their visit as well as for the dentist.

THE USE OF ARSENOUS OXIDE IN DECIDUOUS TEETH.

It was my original purpose in presenting this paper to devote it largely to the consideration of operative procedures on deciduous

teeth, but the topics discussed so far have extended this essay to such a length that I will not attempt, at this time, to take up the details of practice in the treatment of the various conditions met with in the mouths of children.

There is one topic, however, I would speak of in this connection, namely, the use of arsenic in the deciduous teeth. Dr. Jordon, in the paper mentioned above, advocates the use of arsenous oxide for devitalizing exposed pulps in deciduous teeth, and reports very favorable results following such practice. In the course of the discussion of her paper considerable opposition to such use of arsenic was manifest.

Arsenic is a drug which seems to have a peculiar selective effect upon the dental pulp, and a quantity so minute as to be almost inappreciable is sufficient to destroy the vitality of even an adult tooth pulp. When used with discretion, I see no reason why it should not be safely employed in little children's teeth. The danger lies in applying too large an amount of the drug, or in leaving it in contact with the pulp too long; hence, if it is used in deciduous teeth at all, it must be applied with extreme care and with the assurance that the child will be seen again within twenty-four hours.

LOSS OF THE DECIDUOUS TEETH DUE TO IGNORANCE.

If parents, though educated and cultured, have been indifferent to the care of the mouths and teeth of their little ones, if they have neglected to consult the dentist until the deciduous teeth have become almost hopelessly involved, and the child is suffering pain that might have been avoided; if they have failed to appreciate the value of sound teeth for the general welfare of their child, and if they do not realize that any effort and expense necessary to save the deciduous teeth is worth while, it is all due to ignorance.

But all this is to be changed. The educational propaganda on the subject of oral hygiene which is sweeping the civilized world is surely destined to bring about a new order of things, and if every dentist faithfully and earnestly does his part, if he is not recreant to his most sacred professional obligation to patiently instruct all who come under his care, both the old and the young, in the care of these priceless organs, which are designed for a certain useful purpose and are intended to endure and not to be prematurely crippled or lost, then soon ignorance will be no more, human life will be made happier, healthier, and longer, and all mankind will rise up and call the dentist blessed.—*Dental Cosmos*.

SOCIETY ANNOUNCEMENTS.

AT a meeting of the Educational Committee of the Nova Scotia Dental Association, held in Halifax recently, it was decided to hold the 1912 convention on July 11th and 12th in the Maritime Dental College, Halifax.

Drs. Craig and MacDonald have promised something interesting in the way of clinics, and Professor MacKenzie, the new President of Dalhousie University, and Dr. Harris, the new Professor of Physiology, will be invited to address the convention. Altogether, in view of the excellence of the programme and the discussion of matters of great interest to the profession in Nova Scotia, it is believed that this convention will be the largest and best in the history of the Association.

Nova Scotia is at its best during the summer months, and no more delightful spot for a holiday can be imagined. Any members of the profession who may be visiting Halifax will be gladly welcomed.

COMBINED MEETING OF THE CANADIAN AND ONTARIO DENTAL ASSOCIATIONS, HAMILTON, JUNE 3, 4, 5, 6, 1912.

THIS meeting promises to be unique in the history of these organizations. The Hamilton Dental Society is one of the liveliest dental organizations, big or little, in Canada. The energy and enthusiasm they have brought to the work of programme formation have produced results which indicate a programme of compelling interest and attraction. Drs. Hartzell, Minneapolis; G. H. Logan and Hart Goslee, Chicago; Geo. Grieve, Toronto; C. A. Murray, Moncton, and J. O'Neil, Fort William, are already on the programme.

A large clinic and the best manufacturers' exhibit ever seen in Canada are promised. Those interested specially in the Oral Hygiene Campaign will find an evening devoted to this entirely. The splendid programme, the ideal location, Brant House, Burlington, with its social possibilities, and, above all, the good fellowship of the Hamilton men, make this convention the one you *cannot* miss.

PROVISIONAL PROGRAMME CANADIAN DENTAL
ASSOCIATION AND ONTARIO DENTAL SOCIETY.
JUNE 3, 4, 5, & 6, 1912, HOTEL BRANT.

MONDAY, JUNE 3RD, 1912.

10— 1.00 p.m.—Registration.

2.00 p.m.—President's Address.

Discussion read by

4.30 p.m.—Dr. T. B. Hartzell of Minneapolis, How to Con-
serve the Alveolar Process.

8.00 p.m.—Four 15-minute papers by leading Canadians.

Dr. Hartman, Meaford, Hypodermic and Anes-
thesia.

Dr. O'Neil, Fort William, Treatment of Children.

Dr. C. A. Murray, Moncton, Business Possibilities
for the Dentists.

TUESDAY, JUNE 4TH.

9—12.00 m.—Clinics.

2— 6.00 p.m.—Entertainment.

8—10.00 p.m.—Business Reports, Committee.

WEDNESDAY, JUNE 5TH.

9—12.00 m.—Clinics.

2.00 p.m.—Dr. W. G. H. Logan, Chicago, Diagnosis and Treat-
ment of Caries, Necrosis and Fractures of the
Jaws.

4.00 p.m.—Dr. Geo. Grieve, Toronto, Orthodontia for the Gen-
eral Practitioner.

8.00 p.m.—Entertainment.

THURSDAY, JUNE 6TH.

9.00 a.m.—Dr. Goslee, Chicago, Gold Work.

THE TORONTO DENTAL SOCIETY.

REPORTED BY C. G. SCOTT, D.D.S.

THE session of the T. D. S. held on February 12th, 1912, at McConkey's was one of the most profitable to the members present, and the officers of the society are to be congratulated on their selection of essayists for the evening.

For this meeting the executive did not go across the line for speakers, and the result was that we enjoyed one of the best evenings that the Toronto Dental Society has had.

The only fault anyone could find was that there was so much ground covered by the essayists that the individual papers did not receive the attention and discussion that should have been given to them.

Dr. Cummer's paper on "Partial Dentures" was a splendid one, and the writer must be congratulated on the thoroughness and explicitness of an essay which must have taken a great deal of study to prepare. This paper in itself would have been sufficient for the whole meeting, and will be read with profit.

The essayist exhibited a number of models showing different stages in the construction of some of the dentures mentioned in the paper.

Dr. A. W. Thornton, in a paper on "Crown and Bridge Work," said that the aim of the operator should be:

- (1) To give rigidity of the arch.
- (2) To give the patient an adequate masticatory apparatus.
- (3) To produce an esthetic effect.
- (4) To make a restoration without being bulky and unpleasant to the patient.

Suppose an upper incisor has been badly ravaged by decay or greatly discolored, what better restoration can be made than a suitable, well-fitting porcelain crown? If a molar has been broken down to such an extent that a filling is impossible, is there any method by which we can restore that crown so well as by placing posts in the root or roots and building up with amalgam and setting a gold shell crown?

What is true of crown is also true of bridge work.

Brigework has been the sheet anchor of the advertising man, and this fact has brought condemnation on this branch of dentistry,

but there is no operation which we can perform that produces such satisfactory results as well-constructed bridgework.

The use of the forceps has been greatly lessened since bridge-work has become more commonly used.

The open-faced crown, while it may have been useful in some cases, has no place in modern dentistry.

Bands should not extend under the gum, except in special cases.

The loose bridge has great usefulness, as we allow for the individual movement of the teeth.

In casting bridges directly against the porcelain a piece of iridio platinum wire must be inserted between the abutments to give sufficient strength and prevent shrinkage.

The Goslee interchangeable teeth are easy of manipulation, correct in principle, and a godsend to the busy man. They are supplied for both anterior and posterior work.

The essayist warmly defended the practice of crown and bridgework as one branch of our profession which, if properly performed, raises the dentist in the eyes of the community.

Dr. Thornton showed a number of practical cases. There was one unique case of bridgework in which the abutments were tipped toward each other. A compound inlay was made for each abutment, the cavities being so prepared, with the walls parallel, that the bridge could be inserted when complete. Instead of attaching a post to each inlay, an opening was left in each to accommodate a post which was pushed through the inlay and into the enlarged root canal after the bridge was in place. This is accomplished by having a thin sleeve over the post while the inlay is in wax, the withdrawal of the post leaving the sleeve to be cast in the inlay, and thus providing an accurate opening for the later insertion of the post.

Dr. Bothwell stated that when Dr. Roach was here four years ago that he was much interested in the subject of bar lowers. Since that time he had applied the same idea to the uppers with very satisfactory results.

Dr. Wood described a case of removable bridgework for the upper arch in which he used natural teeth. The patient was present and the work was shown in position in the mouth.

Dr. Doherty showed some practical cases using bar uppers, which he found very satisfactory. They were constructed by using a saddle on each side. These saddles were connected by a gold bar close to the arch, and attachments were made to the natural teeth by using the Roach, etc., or gold clasps.

Dr. McDonagh opened the discussion, and was followed by Drs. Husband, Webster and others.



This Department is Edited by C. A. KENNEDY, D.D.S.

Librarian Royal College of Dental Surgeons.

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

Address. C. A. KENNEDY, D.D.S., 2 College Street, Toronto.

TINCTURE OF IODIN AS AN ANTIDOTE IN PHENOL POISONING.—Maberly indorses tincture of iodine as a potent antidote in phenol poisoning. He administered a teaspoonful of the tincture in water to a negro, who, by mistake, had swallowed a strong solution of phenol instead of whiskey. The result was excellent. He also gave to children of three years of age, who had taken phenol, five drops of tincture of iodine in water, repeatedly, also with best results.—*Bulletin General de Therapeutique, per New York Med. Journal.*

CAUTION IN THE USE OF LACTIC ACID IN TREATING PYORRHEA ALVEOLARIS.—Care should be taken in the use of lactic acid in treating pyorrhea alveolaris in order to prevent the acid from attacking the teeth. During the past six months the writer has seen a number of cases in which caries was caused by its use, although great care had been taken in manipulating the acid.

INSTRUMENTS OF PURE NICKEL FOR INSERTING SILICATE CEMENT FILLINGS.—Instruments of pure nickel are most suitable for inserting silicate and other cement fillings. They are preferable to agate or ivory instruments, as they permit of easy manipulation, are non-breakable and do not produce decoloration of the filling materials.—*Zutchrift f. Zahnheilkunde.*

CAPPING VITAL PULPS.—It is always a risky thing to cap a vital pulp, yet there are cases when a patient is unable to present for several sittings. The cavity is then excavated and sterilized thoroughly and the pulp is touched with a pellet of cotton saturated with chloroform. A piece of writing paper, sufficiently large to cover the pulp, is cut, dipped into chloroform and coated with a small quantity of chloro-percha to which some aristol has been added. This capping is laid over the pulp, dried with the hot-air syringe, and thinly mixed cement is flowed over it. After the cement has set the cavity is filled according to demands.—*Archiv fuer Zahnheilkunde.*

MERCURIAL POISONING: A WARNING.—Dentists are frequently in the habit of shaking the expressed mercury from freshly-mixed amalgam upon the office floor. These little globules of mercury will roll under the adjacent furniture or become lodged in the folds of the carpet and the curtains, and their evaporation may bring about a local mercurial poisoning.—*Hermann Prinz, Dental Era.*

KEEPING CARBORUNDUM WHEELS SHARP.—There is a tendency in all abrasive wheels to become glazed and lose their efficiency, and under some kinds of usage to wear out of true. To remedy this, diamond tools have been employed. They are expensive in first cost, easily injured, and, to be effective, require to be used with a degree of skill all do not possess. An inexpensive affair has long been used for truing up emery wheels and grindstones that has proved effective. It is composed of a number of thin steel wheels, about one or two inches in diameter, free to revolve, having sharp-pointed teeth, forming a group with a face of one or more inches across, held in a suitable handle. This tool rapidly freshens the surface and trues an emery wheel or grindstone as readily as one would turn up a cylinder of wood, and with but little wear to itself. A modified form has recently appeared at the dental depots that is well worth the trifle it costs. Applied to the rapidly-revolving wheel, in a few moments the glazed surface is removed, and the efficacy of the wheel very much increased. It leaves a much more effective surface than does the diamond tool, and is much easier to use.—*T., Brief.*

BROKEN RICHMOND PIN.—The method I propose to describe now is not new, but is worthy of repetition: (1) If the pin is broken off at its base, drill the remainder out and fit another pin in position and solder as usual. (2) If the pin is broken in half, then roll a piece of thin platinum around the stump to make a tube. Remove from the stump, and with a broach fill up one-third of the tube with wet whitening of plaster. In the remaining two-thirds place tiny pieces of solder and run in the flame. Now a solid pin has been obtained, except for one-third, and into this part goes the broken stump. Invest the crown as usual, place tube in position, and solder. The result is a solid pin, which can be filed down or manipulated as required.

MANIPULATING THE SPRUE IN WAX MODEL FOR CAST INLAY.—In cooling the sprue in a wax model for an inlay, the cold water should be thrown on the sprue first and then on the wax. This will prevent the soft wax from being washed away from the sprue. It is easier and more accurate, when possible, to remove the inlay by clasping the sprue between the thumb and finger instead of pliers, as in that way we can feel the easiest way to remove it.—*E. E. Haverstick.—Dental Summary.*

SUGGESTIONS FOR CONVENTION PROGRAMME.

FROM CONTRIBUTORS.

HOW shall the profession meet its new obligations resulting from the propaganda of popular education in oral hygiene and preventive dentistry?

PEDAGOGIC INSTITUTE.

AMONG the suggestions for the programme of the C. D. A. we have not noticed that of a meeting of teachers in our Canadian Dental Colleges. It is possible that it has already been considered by the Programme Committee, and time may or may not have been allotted to it, but in view of the great interest taken in the meeting of the Institute of Dental Pedagogics held in Chicago recently it would seem that a meeting of our Canadian teachers, at which reports from the I. D. P. by representatives from Canada might be received, discussion of teaching methods, etc., would be desirable. The idea of the formation of a Canadian Institute of Dental Pedagogics might even be considered.

DOMINION DENTAL COUNCIL REGULATIONS.

ALTHOUGH the regulations of the D. D. C. have been made by representatives of the provincial associations composing that body, and are not the result of any action of the C. D. A., a report of the proceedings at the biennial meeting has always been made to the C. D. A. as a matter of courtesy. That one of the regulations of the D. D. C. is inconsistent with the ethics of our profession and the expressed objects of the Council may not be generally known.

An expression of opinion with regard to the regulation requiring that all applicants for examination by the D. D. C. must be graduates of a *Canadian* college might be desirable.

The matter of uniformity in matriculation requirements of the various provinces might also be profitably discussed.

ORAL HEALTH.

EDITOR — — WALLACE SECCOMBE, D.D.S., TORONTO, ONT.

ASSOCIATE EDITORS { GEORGE K. THOMSON, D.D.S., HALIFAX, N.S.
W. H. DOHERTY, D. D. S., TORONTO, ONT.

A Monthly Journal devoted to the interests of the Dental Profession, and to the furtherance of Public Health through the education of the Public in relation to Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

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Vol. 2

TORONTO, APRIL, 1912.

NO. 4

EDITORIAL.



"ORAL HEALTH" in recent issues has recounted certain facts that are at variance with principles for which this journal is prepared to stand. These are:—

FIRST:

That in the best interest of the dental profession, the profession should have its own professional literature, quite independent of publications controlled by dealers in dental supplies.

SECOND:

That the Oral Hygiene Campaign, and literature pertaining to it, should be controlled and guided by the dental profession [and the profession only] until such time as it receives its proper recognition as a phase of public health.

We have taken our stand upon principles which we believe are sound and in accord with the best thought of the dental profession. We quote from an editorial in the last issue of "The Journal of the Allied Societies," a publication purely professional in character, edited and published by dental societies of New York and Massachusetts, allied for this purpose:—

"In so meeting the needs of the department of medicine, a journal of dental science is of real value in proportion to its accuracy and excellence of form, and to its independence of any interest ulterior to its scientific aim. It is safe to assume that the men most interested in its singleness of motive and those most likely to preserve it are the members of the dental profession."

“ There is no hidden or invidious meaning in these words. The statement is made with a full knowledge of the fact that the most important contributions to dental literature up to the present have come through the media of journals owned by supply houses. This knowledge, however, does not conflict with our belief that the true proprietors of dental literature should be the men of the dental profession.”

We have no hesitation in saying that both the form and tone of a few dental journals published by supply houses are such that, except in the single particular of their ownership, they fully meet the requirements of the best type of professional literature. There is also a well-known supply house which issues a monthly circular. While it usually contains an article pertaining to Dentistry, it makes no pretention at being a “Dental Journal,” but is sent, and comes, on the face of it, as a straight and dignified business appeal.

It is the brazen commercialism of some of the later additions to the list of dental journals that has created a condition that is inimical both to the prestige of the dental profession and to the great cause of oral hygiene as a health measure. When the “publisher” of a journal of this type issues “straight talks” to the profession we begin to wonder what are the duties of the editor. When a “publisher” intimates that the Oral Hygiene Campaign is a windfall for the dentist and the dealer—give it a boost—it is time for the profession to very clearly define its attitude on the question.

More than one protest has been uttered against this and similar efforts to capitalize this movement. The “Cosmos” some time ago had an article by Dr. E. C. Kirk, the editor, in which, speaking of the whole question, he said:

“ It is not necessary to more than allude to the tendency which has arisen in various ways to commercialize this movement, as the tendency is doubtless familiar to all of you. Nothing can so quickly neutralize the advantages of this movement, both to the public and to the dental profession, as to furnish grounds for the suspicion that our claims regarding the beneficial character of this service as a public health measure are but a cloak to cover the commercial activities of the dealer in dental supplies or the nostrum vendor. The taint of suspicion of commercialism has already served to weaken the movement in various ways and in several localities.”

There are no questions that have ever come before the profession that are of greater importance than these we have referred to, particularly at this time, when both the profession and the great cause for which it stands are just beginning to receive public recognition.

DENTAL LECTURES IN MEDICAL COLLEGES.

THIS is a matter which has been discussed at medical and dental meetings time and again, and the necessity of a dental lecturer on the staff of the medical college admitted by members of both professions, but we are not aware of any medical college having regularly appointed one.

In Halifax permission has been asked of the Maritime Dental College, by the faculty of the Medical Department of Dalhousie, for the medical students to witness operations in the infirmary of the Dental College.

PRESS AND PUBLICATION COMMITTEE.

WE have no doubt that a full report of the coming convention will be published. In the proceedings of the 1910 meeting of the C. D. A. and O. D. S. it will be noticed that papers and reports are published in full, but discussion and resolutions arising therefrom in some cases are omitted.

No mention is made of the army dental surgeon, although a committee was appointed, held a meeting, and reported at the session on board the steamer.

The discussion and resolutions following the reports of the C. O. P. A. and Ontario Educational Committee were likewise omitted.

There was probably good reason for these omissions, as the acoustic properties of the steamer were not good, and we only refer to the matter now so that the committee of the 1912 convention may realize that the discussion and the resulting resolutions are often more profitable than the reports and papers from which they spring.

Apropos of resolutions, would it not be a good idea to write those of importance, requiring lengthy discussion, on the blackboard in full view of the whole meeting.

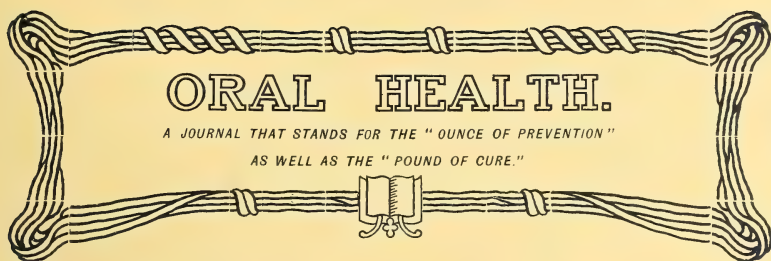
THE Hospital for Sick Children, Toronto, has long had a reputation for the very highest efficiency. The recognition of the importance of mouth health, indicated by the organization of the dental department (described by Dr. Bothwell in this issue) will be of far-reaching importance to the cause of oral hygiene.

“A man’s as good as he
makes himself,—but no
man’s any good just
because his grand-
father was. Its
up to you !”



W. J. BRUCE, D.D.S., Kincardine
(President Royal College of Dental Surgeons of Ontario)

The Annual Meeting of the Board of Directors will be held
in the College Building, Toronto, commencing
Monday, 29th April, 1912.



Vol. 2

TORONTO, MAY, 1912.

No. 5.

DEPOSIT OF SALIVARY CALCULUS.*

BY G. V. BLACK, M.D., D.D.S., SC.D., LL.D., CHICAGO, ILL.

ONE year ago in an article entitled "The Beginnings of Pyorrhea Alveolaris," presented at the annual meeting of the Second District Dental Society, Brooklyn, New York, I devoted several pages to the announcement of some recent discoveries regarding the deposit of salivary calculus. This paper was published in the June, 1911, issue of the *Items of Interest*.

When it was arranged that I present this subject at this meeting, it was supposed that I would have about two months for further work that had been begun, but ill health has made that impossible. Under the conditions now, rather than fail entirely in what was promised, I will tell the story of the results of this investigation so far as it has developed, presuming that many of those present may not have seen that which has been printed. The lantern slides will be the same as those published in the *Items of Interest*.

The literature has been carefully searched for any help that it would afford. It seems that no very substantial progress has been made for very many years. It is true, however, that occasional efforts to gain further information were noted. Among these perhaps those by Burchard and Kirk (*Cosmos*, 1895, page 826; Burchard Dental Pathology, 1898, page 448) have merited most attention. These theories seem to suppose that the formation of salivary calculus is due to a play of chemical affinities in the fluids of the mouth itself. This now seems to me untenable.

*Read before Chicago Dental Society, January 23rd, 1912.

My studies of the deposit have been several years developing. They were begun in this way: I wear a full set of artificial teeth in the upper jaw. Calculus was frequently observed on this plate. This plate was examined critically morning and evening for deposits of calculus, and thoroughly cleaned after each examination. In these examinations I soon learned this important lesson—when a plate worn in the mouth twelve hours, after having been perfectly cleaned, is placed under a stream of water from a hydrant for a few minutes, it will be perfectly cleaned of everything soluble in water. If there be no clinging of particles of food or other solid particles, the insoluble deposits only will be left. If the saliva is normal there will be nothing insoluble on the plate. In this I am supposing the plate has been so finished as to present no interstices or indentations that may become filled with food debris and micro-organisms. Every part of the plate should be finely polished.

The study of the occurrence of the deposits followed day by day, and often four or five times per day, gave important information. It showed in the most conclusive way that the deposit of calculus is paroxysmal. These paroxysms of deposit occur with extreme irregularity. For a considerable time they seemed to come without cause or effect further than the fact of the deposit. It was soon discovered, however, that a paroxysm of deposit of calculus was generally—though not in all cases—preceded by a deposit of a gummy material that was not dissolved away in running water, hot or cold, and which gave no appearance of calcium salts. Afterward when the plate was otherwise clean, this material remained, giving the part of the plate a shining, varnished look, and caused it to feel slightly greasy to the fingers. Generally it is perfectly transparent, not hiding the plate in any degree. I have seen this material spread over the entire plate, though such an amount of it is rare. More generally it is confined to the neighborhood of the salivary ducts. It is coagulated and whitened by boiling water and by alcohol or phenol. In this it behaves much like albumin. Sometimes the entire deposit will be of this clear material, but the rule is that a white or greyish color appears in the central part and spreads more or less widely over the area. The fact that I observed this order of deposit in my examinations, coupled with the general idea that the calcium salt was a precipitate from the saliva—which I had held in harmony with general opinion—led me to say in my first writing that this agglutinating material was deposited first, and the precipitated calcium salts became entangled in it. It now seems to me that this was an error. After watching it longer and studying the deposit closer, I am more inclined to the opinion that a certain variety, or quality, of the gummy material carries the calcium salt with it because of a chemotactic quality that brings about this addition of salts. The fact remains, however, that the calcium salt is in

the form of a precipitate and remains in that form in the hard calculus. This white material is a stronger, thicker deposit than the clear material about it, and it constitutes the bulk of the deposit in the more ordinary paroxysms. The abatement of the paroxysm is usually in the reverse order, the clear material continuing for a short time after the white deposits cease.

The most usual order of the parts of a paroxysm then, is, first, the clear deposit which spreads widest; then the white deposit confined more closely to the opening of the salivary ducts; then in abatement the clear deposit continuing for a time after the white has ceased. This deposit taken as a whole I shall call "Agglutinin of Calculus," leaving the discussion of its intrinsic characters until later.

The time which a paroxysm may continue presents very wide range. In some instances I have noted well marked paroxysms that were over and done within five or six hours; others have continued for three or four days.

In order to obtain a clear conception of the rise, progress and abatement of these, plates or traps should be examined and cleaned very frequently, often once every two or three hours. Not infrequently a paroxysm occurs during the night; the plate is examined and cleaned in the morning, and no further deposit occurs. Sometimes I have found persons, especially those in a very low physical condition, who had almost a continuous deposit of the clear agglutinin and none of the white. In such cases the clear material, when not regularly removed, will harden to a cheese-like consistence, and is very difficult to remove with the brush. Persons will sometimes be seen to remove this with the finger nails. A few others will be found to have the deposit of the white material occurring so frequently that it seems to be a persistent condition unless the plates be observed and cleaned once or twice every day.

When plates or natural teeth are cleaned every day once or twice, any of this agglutinin is easily removed with a brush and water. Nothing else is needed. If it remains forty-eight hours, it becomes very difficult to remove with the brush. If it remains a week it cannot be brushed away; it will have become so hard that it must be scraped away. This is true whether calcium salts are contained in it or not. However, it is only that containing the calcium salts that forms the hard stone-like incrustations upon the natural teeth or on plates. In the process of hardening, the soft agglutinin seems to disappear, but in its dissolution, or decomposition, a material is furnished that binds the calcium salts together in a more or less compact mass. Often this becomes actually stone-like in its hardness. Therefore we may find calculus of all grades of consistence from very soft to very hard incrustations.

THE CHARACTERS OF THE DEPOSITS.

The study of the deposits gave some difficulties. The most astute chemists whom I have consulted have told me that chemical analysis of this material would give no useful information. Chemical recognition was all that was necessary and this was not difficult. The physical properties and what it does when associated with other material, are the essential things to be understood, and my presentation will be, in the main, from that standpoint. I began microscopic studies of it to discover any form elements it might contain, but it was so transparent that my first effort to find form elements seemed futile. But in pressing it down in water, or in alcohol, the material appeared to be in globular form, the globules being irregular in size. Pressing down in balsam failed, because the whole mass became so transparent that it could not be seen. Pressing down in a filtered solution of shellac gave somewhat better results. All of these plans were but partially successful in showing form elements, yet they gave the idea of globules more or less definitely.

Staining failed at first, for the reason that the material failed to hold the stain. Persistence in this effort finally began to give results. Strong solutions of the "Alcohol Soluble" stains did the best; of these gentian violet and eosin gave the best results. Nigrosin also gave a certain degree of selection by leaving a certain character of globules unstained. Using formalin or phenol as mordants gives somewhat improved results. The material should remain in the staining fluid from six to twenty-four hours, and then should be washed from half an hour to an hour—often longer—in absolute alcohol, to remove superfluous stain and bring into view the margins of globules. The stained specimens may then be mounted in balsam in the usual way. Thus far the stains seems to be permanent.

Gentian violet gives a selective stain, bringing to the foreground globules of certain chemical qualities. Eosin gives a diffusive stain which colors all parts alike, but gives a view of the globular forms. Nigrosin colors some of the globules intensely and leaves others clear, producing some very curious results.

OF THE NATURE OF THE AGGLUTININ.

The agglutinin is composed of several varieties of globulin. A globulin is any one of a class of albuminous proteid compounds, insoluble in water or alcohol, but soluble in weak solutions of the neutral salts. The animal globulins include fibrinogen, serum globulin or paraglobulin, globin, myosinogen, crystallins and vitellin. This definition was written after consulting a number of medical and general dictionaries, but is not quite like any one of them.

These globulins are the most important of the proteid compounds. The common physiological process could not be carried on without them. (See any first class modern work on Physiology.) Yet in the condition we are discussing, these globulins serve as the agglutinin in the formation of salivary calculus, and seem to determine its deposit. The thought that these globulins, so important in the animal economy, take part in such a process, and that conditions occur in which the secretions and excretions are loaded with them, including the urine, has been very distasteful to me. But the facts I have been reciting seem to enforce this view. I can no longer think of it as having been formed in the mouth.

GATHERING MATERIAL FOR STUDY.

For a considerable time the gathering of this material in a form for study, presented much difficulty. It was found impossible to take it up from its place of lodgement and transfer it to a cover-glass without seriously distorting its form. But finally I happened upon a device by which it may be gathered easily and perfectly without considerable difficulty. With this device, which may be called a trap, the material is obtained in the best condition conceivable for staining, mounting and preserving for study. It consists in cutting a flat bottomed trough in the buccal surface of a rubber plate worn in the mouth, and fitting to this a small frame of gold plate attached with screws. This is easily removed and replaced. A cover-glass is ground to fit the space prepared. This is laid in, the gold frame laid over it, and then fastened down with screws. This is worn in the mouth without inconvenience. When a deposit is discovered on the glass, the screws are removed, the gold frame lifted, the cover-glass carefully removed without disturbing the deposit, and conveyed to vessels ready to receive it for washing, staining and mounting. In this way we are able to bring the material under the lens in the exact form in which it was deposited.

In case the person has natural teeth, a similar trap may be devised and attached in removable form to the molar teeth or the lower incisors. This may be removed and laid in water while eating, if that seems desirable. This answers the purpose just as well as a plate with artificial teeth, or even better.

EXCITING CAUSE OF THE DEPOSIT.

With the means of collecting this material detailed, and the opportunity for inspection several times daily, one would seem to be well prepared to find the exciting cause of the deposit. Yet with all of this, the study was a perplexing one until finally a clew was found. A first clew to an exciting cause was found by keeping daily records of the food eaten in conjunction with the paroxysms of deposit. This soon gave a record of very good dinners, especially well handled as a direct cause of paroxysm after paroxysm, with unerr-

ing certainty. With myself and with others whom I have had the opportunity to examine, that relation has been practically constant. Now for a year and a half I have been able to be entirely without deposits of calculus in my own mouth, unless I purposely bring it on, which I have done many times for the purpose of obtaining specimens for study, or for the purpose of trying the effect of different food stuffs.

THE FOOD HABIT.

After studying this matter for several years, and regularly weighing the food eaten for a part of this time, I am of the opinion that we, as a people, are eating too much food, and that this is responsible for deposits of salivary calculus and probably other calculi as well. I do not think I was a larger consumer of food than the general run of men, but when I reduced my food one-third I had no more paroxysms of calculus; neither did I lose one pound of flesh. It is true that I found certain foods that should be partaken of with some caution. In the main, however, it was the quantity of nutritive material, rather than any other special quality. It requires less quantity of ham and eggs, braized meats with rich brown gravy, and such like foods, to produce a paroxysm of deposit, than of ordinary bread. But a large meal of bread alone, or bread and butter, may bring about the same result. If I go to a restaurant and order boiled pigs feet and sauerkraut and eat the whole of the order usually served, I will have a flood of deposit within six hours. If, however, I eat but half or two-thirds of the order served, I will have no calculus. I may drink one glass of milk before retiring at night, and arise in the morning with a clean mouth, but if I drink two glasses of milk, especially milk with the cream, I will have a deposit next morning that is much too thick for microscopic study.

It seems probable that the continued use of salt meats may be responsible for the formation of a calculus habit. Such food is so distasteful to me that I find it difficult to give it sufficient trial. At present it seems certain that amongst our people who live mostly, or altogether, on the fresh foods of our markets, and especially persons with fair to especially good digestive power, take food in such quantities that more of the proteid compounds, and especially the globulins, are formed than can be used. Then there are eliminated in paroxysms in which not only the saliva, but the urine and other excretions are crowded with them. The reason why a dose of Epsom salts quickly ends a paroxysm of deposit of calculus is that the elimination is directed to the alimentary canal and the system is quickly drained of the superfluous material.

In what I have written here I wish it distinctly understood that I do not regard this problem as having been worked out.

Further studies may develop facts that will lead to materially different views. It is a suggestion for further inquiry, rather than a finalty.

THE MEANING OF THIS STUDY TO DENTISTRY.

If dentists generally would take up the study of these deposits earnestly, learn well the conditions which lead to them, study well the local conditions which favor them, together with the conditions which tend to render them innocent of harm, or to prevent them altogether, it would furnish a basis of prophylaxis that would lead to lasting benefits to our people. Dentists seem not to have begun the study of form with reference to cleanliness, forms which naturally refuse deposits, and forms which continually invite deposits. A form of the free margin of the gingivae which rises well up onto the crowns of the teeth and terminates in delicately thinned edges that are even actually sharp, give no place for microscopic growths or for debris. The opposite condition in which the terminal margins of the free gingivae have become dulled and thickened, forms a line about the teeth that invites lodgements. Of all things this is to be prevented in every way possible. Deposits of salivary calculus that are washed away while yet in their soft, pasty state will have done no harm to well formed gingivae. But it is still better not to have the pasty calculus to brush away. If the wave of so-called prophylaxis that is sweeping over our country could take this more intelligent form, and develop a more definite policy based on lines of well observed facts, they might teach forms of cleanliness that have more enduring qualities and freedom from harmful results.

I do not wish to decry any earnest effort to serve our people better, but in watching the great wave of so-called prophylaxis that has its devotees among us, I have been very fearful of the results. Good, well formed gingival borders will not long retain their finely thinned margins under frequent scrubbing with pumice-stone on a stick, or a bit of tape; I have a fear that the ultimate record will be of a condition that is no good as in the beginning. In watching the spread of this work, and especially that which has been written about it, I have failed to find apparent a close study of the conditions that call for treatment in distinction from those that do not. I see no reason for scrubbing the clean portions of the crowns of teeth, for certainly they cannot be made better. Let us hope that this may take on a more studious and thoughtful form. The genius of the present century will be devoted to the prevention of disease, both in general medicine and in dentistry. Success in this cannot accrue without the most thoughtful and careful work in the science of health. It is the wise men in the laboratories that are doing most for preventive medicine. These men are supplying the thought by

their experimental results that point the way to great things. We ought to have more of this class of workers in dentistry. We have hundreds of young men in dentistry who are fitted for this work by their preliminary training, who could help us if their thought could be directed into the proper channels and proper encouragement given them by the general profession.

In general medicine it seems probable that much useful information of importance in diagnosis may be derived from a study of the elimination of the globulins. How and where, for the most part, will be determined by trial, or in other words, a general study of the subject as it appears in the secretions generally, and especially in the excretions. Already globulinuria has a considerable literature, though the knowledge of it seems to be rather indefinite.

In an article entitled "Euglobulin Reaction in Urine," by Arthur R. Elliott of Chicago, in the *Illinois Medical Journal* for November, 1911, page 520, the progress of this literature is cited. There is also a discussion of the difficulties of diagnosis between albuminuria and euglobulinuria, a matter that is very liable to confusion by the close resemblance of the reactions of the globulins to albumin.

From what has been said of the deposit of globulins in the form of agglutinin of salivary calculus, one would expect the appearance of the globulins in urine to be transient. This, in fact, is what seems to occur, and these have been referred to as innocent albuminuria. This article by Dr. Elliott, is worthy of study for both its citation of authorities, and its discussion of the means of differential diagnosis now known.

If the physician could command the time to learn to distinguish readily the paroxysms of the deposit in the mouth, he would probably find a coincidence between this and the innocent albuminurias, and that each is an expression of the same systemic condition. It is possible that the careful comparative study of the saliva and urine may lead to clearer definitions, and simplify the means of division of the grave and the innocent albuminurias.

But are these repeated paroxysms of elimination of globulins innocent of injury to health? May they not have a causative relation to some grave conditions, or a harmful relation to more or less grave conditions now not fully understood? It opens up a very wide field for question and investigation.

The examination of the saliva and other secretions, in conjunction with the urine, seems to be demanded.

DISCUSSION.

Dr. Frank W. Low, Buffalo, N. Y.:

First, I want to make acknowledgment for the great honor conferred upon me by your Programme Committee in inviting me to come to Chicago; and second, for the greater honor of inviting me to open the discussion on Dr. Black's paper.

In the East—by inference at least—I have recently been accused of giving some pretty loose, unscientific talks regarding research work. Well! it is quite likely that I shall indulge in some more of that same kind of talk to-night, because by an unlucky chain of circumstances for which I suppose no one is to blame I did not see a copy of Dr. Black's paper, and so I have to make my discussion extemporaneously. However, I do not think it will make very much difference. Until I had a talk with Dr. Black to-night just before this meeting I most firmly believed that the thing which makes the plaque of decay, which in practice I find always most abundant in the presence of a thick, ropy, and as I believe a *strongly Alkaline* saliva, was the same substance as that which Dr. Black has discovered to be always underlying all calculus formations. But I have changed my mind. Perhaps if I were to make some experiments in this direction I would change my mind back again.

I cannot say anything of very great value with regard to the study of calculus because I have never made any experiments relating to it. I sit up as late at night as anybody else, but I have to work at almost disheartening disadvantage because I have no chemical knowledge. I am one of the old type of dentists who did not get much chemistry in his student days, and consequently I have to rely on what others say. But the trouble with the work that has been done in the East has been that we have had too expert biologists and not enough supervision by the dentist who in active practice sees the conditions in the mouth as they really are.

Professor Gies of New York has made some studies and drawn some conclusions which he has reported in the *Journal of the Allied Societies*, which convinced me that he does not know what he is looking at. He reports, for instance, that there is no connection between the amount of potassium sulphocyanate present in the saliva as related to a condition of rapid superficial enamel decay, but he has grouped erosion, the slow, dark brown decay, and rapid enamel decay, together. (But we will not discuss potassium sulphocyanate to-night.)

I want to say that I antedated Dr. Black in recommending that the essential ingredient of a good mouth wash is good wet water. (Laughter.) He may have known it before, but I was the first to publish it.

Dr. Black:

I am glad of it.

Dr. Low:

I allow patients to clean their teeth with any antiseptic they may choose if they will only make the salution dilute enough, believing that so little of the mouth wash does no harm while it may help to keep the brush clean. The rest of it is all placebo. If a woman comes to me and asks whether she can continue the use of glyco-thymoline as a mouth wash I do not hesitate to tell her yes, provided that I see she has healthy gums, but I caution her not to use heavily tinctured washes.

Dr. Black has spoken to you about prophylaxis. There is such a thing as *prophylaxis prohibitive*. I read about it in the dental journals and I see it practiced at some clinics. I like to have patients come to me at frequent intervals so that I can watch their teeth and see whether they are decaying or not. Here is the beauty of prophylaxis: By seeing patients at frequent intervals you can detect little cavities and fill them before they get to be large and bad ones. When a patient comes to me at frequent intervals, if I cannot take three patients in an hour and do a good job every time I will take my hat off to the next man. I use a soft maple stick made by the Maxwell Morgan people; I take a sharp knife and scoop out one side so that it fits and goes into the interproximal spaces. When you have these spaces clean you have the teeth clean. The rest of the teeth will take care of themselves, but you must be careful not to injure the gums. I use the very finest "flour of pumice," and I do not go bang up under the gum margin. If I find deposits there then I resort to the use of a steel instrument and remove them, and then I do not need to do much more.

The worst cases I have had to combat have been those in which there were loose teeth, but in which I did not find tartar. You may call it pyorrhea or anything you like. You will find an agglutinated substance on the teeth and these teeth will wobble about in spite of anything you may do to hold them firm.

I would like to ask Dr. Black if in the cases in which he finds this cheesy deposit without calculus the reaction is acid or alkaline?

Dr. Black:

I have never tried to find out.

Dr. Low:

I want you to try and find that out and let me know.

Dr. Russell W. Bunting, Ann Arbor, Mich.:

Two years ago many of us attended a banquet given by this society, at which Dr. Black was the guest of honor. On that occasion many of us thought that the time had come when Dr. Black

would lay aside his more arduous duties and would enter into a life of ease and retirement, which he had so ably earned. But from what we have seen and heard here to-night we know that no such plan had been entertained by this noble and tireless worker. He has rather gone forward with a new work which bids fair to rank, if not surpass, any which he has heretofore done.

There has been nothing in my experience as a dental practitioner and teacher that has given me more chagrin than has my lack of knowledge concerning the formation of salivary calculus. How often are we asked the question, "Why do salivary calculi form more abundantly in some mouths than in others?" and "What treatment will prevent the formation of calculi?" But two theories have found general acceptance regarding the deposition of the calcareous material, the one that by the escape of the CO_2 , the salts are thrown out of solution in the secreted saliva, and become attached to the teeth by the mucous deposits; the other, that in salivas containing high percentages of acid the mucin is precipitated, and in this precipitation the calcium salts are dragged down by the mucin from the saliva. Other than this our knowledge of the subject has been very meagre, and little work of worth has been done in the investigation of the problem.

We are all therefore very glad to know that Dr. Black has attacked the question with his usual thoroughness, and that from his observations has formulated a hypothesis which is worthy of consideration. His hypothesis stated in few terms is that the deposit of calculus does not depend upon the amount of calcific material in the blood or salivary secretions, but rather upon the presence of a colloid substance deposited by the saliva and in the absence of which the calcareous deposit cannot form. Further, that the deposition of the colloid substance, and hence the formation of calculi, can be stopped temporarily by the internal use of epsom salts and permanently by diet and proper living.

The work which Dr. Black has done, and the results which he has obtained, are exceedingly interesting and furnish us with much food for thought. In the discussion of such a paper as this, involving so much original work, it is impossible to do more than attempt to correlate the work done with some other science or group of facts. With this in view we may consider the other calcareous concretions found in the body in the hope that the knowledge of these may throw some light upon the question. Of all the forms which may occur in the body, those calculi which are found in the urinary bladder most nearly approach the salivary calculi in their method of formation, and it may be well to consider the opinions of medical scientists regarding these formations in the light of a possible correlation with salivary concretions

Stones in the urinary bladder have been known and described from the time of Hippocrates and before, to the present time, and the literature has abundant references to theories held regarding their structure and the method of formation. Very early two forms of stone were differentiated, namely, the phosphatic and uric acid concretions. One of the more valuable contributions to the subject has been that of Rainey and Ord, in 1879, who demonstrated that something more than a presence of phosphates, or urates in the urine, were necessary for the formation of the stones. Ord says: "To make calculi without colloids would be as hopeless a task as making ropes of sea-sand. The pebbles of the concrete would not hold together without the cement to bind them and act on their surface."

Regarding the causes of stone formation, Dr. E. L. Keyes of the New York Medical College, says: "First among the causes of stone formation, according to the best modern investigations, must be placed the influence of the colloids. Doubtless such substances as disturb digestion and nerve force and furnish an excess of uric acid, of oxylate of lime, of phosphates, as the case may be, favor the formation of stone; but alone they are not sufficient. . . . But the fact remains that urates and uric acid may be in excess in the urine for years, and the phosphates for a lifetime, and no concretions into stone take place, while at any given moment, presumably, during the proper co-operation on the parts of the colloids, primary (acid) stone starts into existence; or the presence of a foreign body with inflammation of mucous membrane will speedily give rise to a secondary (alkaline) stone in many individual, whether his diathesis be phosphatic or not. The colloid in the latter case is the alkaline mucopus, furnished by the inflamed mucous membrane." How closely this coincides with Dr. Black's views of the formation of salivary calculi!

Notnagel says in substance: "The changes in the urine referring to the precipitation of uric and oxalate crystals has been attributed to a diathesis toward these salts. It was supposed to be associated with an overloading of the blood and body juices with these substances due to a retarded metabolism, and especially a diminution of oxidation. But experimentally, when oxygen is cut down, the blood is not overloaded with these substances, nor are they excreted in larger quantities in the urine. Nor have uric or oxalic acids been found in large quantities in the blood of individuals with calculi of these acids." He concludes that there is a certain etiological relation between gout and calcareous deposits, but that, inasmuch as we find uric and oxalic calculi in children who have no gout, the two diseases are not due to the same change in the body juices. He does not mention it, but it seems very possible that the colloids might here be the controlling factor also.

Notnagel also makes two other statements which are worthy of note in this connection. He says that phosphatic calculi are never formed in the urinary bladder when the urine is acid; that such calculi are only found when the urine is neutral or alkaline. I should like to ask Dr. Black if it has been his experience that the reaction of the saliva had any effect upon the deposition of phosphatic calculi in the mouth. Notnagel also says that the presence of lactic acid in the urine will cause a precipitation of uric acid. Is it possible then that the lactic acid formed in the mouth by fermentation of the food stuffs at the necks of the teeth may cause a precipitation of the urates from the circulation at that point giving rise to subgingival calculi?

Rainey did a great deal of investigation of the processes by which calculi are formed. It is generally admitted that by his experiments which he carried on in synthetic solutions he conclusively proved that the determining cause of urinary calculi is an increase in density of the urine, and the presence of a colloid substance in solution in conjunction with an excess of urinary salts for "a crystalloid is deposited from solution in the presence of a colloid, and crystals introduced into a colloid solution are disintegrated and reformed by simple molecular coalescence." Is it not possible that the phenomenon of the hardening of salivary calculi may be explained in just this same manner?

When we look through the medical literature for material which we may correlate with Dr. Black's method of prevention of concretions, we find little that has been written or suggested that is of any practical value. Even from very early times nostrums have been used in the attempt to dissolve the stone when once formed, and have been heralded as great panaceas, but have subsequently been proven worthless. The most prominent case in literature is that of the cure advocated by Mrs. Joanna Stephens. Her formula was purchased by the British Parliament in 1739 for the sum of £5,000. The formula was as follows: powder of calcinated eggshells and snails; a decoction of herbs with soap, ashes of swine's cresses, and honey; a pill of calcinated snails, wild carrot seeds, burdock seeds, ashens keys, hips and haws, all burnt to blackness; soap and honey. At the present time the attempts to dissolve the stone have been discontinued.

As we have seen, there is a general agreement on the part of medical observers that the colloids have an important part in the process of stone formation. It then would seem that if calcareous deposition depended so much more upon the presence of a colloid than upon the percentage of lime salts, some effort would have been made to limit the colloid formation. In this regard there is a dearth

of information in the literature and no work of a conclusive nature has been done. Attempts have been made to limit the amount of lime salts ingested, with little avail, pointing again to the colloid as being the controlling factor. For instance, in a case reported by Dr. G. G. Darling of Ann Arbor, he had removed several stones from the bladder of a man at successive intervals. During one of these intervals the patient drank no water, and limited his foods to those which contained the least calcareous material. The succeeding stone formed, however, with a rapidity equal to its predecessor.

Dr. Keyes of New York, in his work published in 1910, outlines the course of treatment which he uses as a preventive measure. (1) Dietetics; (2) Exercise; (3) Encouragement of elimination by other avenues; (4) Diluting the urine constantly; (5) Use of solvents and attempts to dilute the colloids. In his discussion of that part of (5) which pertains to colloids, he says: "To dilute the colloids which seem to preside over crystallization, all that at present can be done is to keep the urine dilute and bland and the digestion perfect, to prevent catarrhal conditions of the stomach and intestines and to avert feverishness from whatever cause." He sums up by saying: "1—Eat lightly; take meat but once a day; eschew sweet foods, dried foods, and above all such foods as interfere with digestion. 2—Drink no wines but white wines, no liquors but gin and whiskey, and these in moderation; drink plenty of water. 3—Exercise freely and in open air. 4—Keep bowels regular. 5—Alkalies or solvents I prescribe with but little hope that the patient will continue to use them."

In the light of our personal knowledge the claim of Dr. Black that the calcareous deposition is determined by the presence of a colloid, and that this colloid is the result of improper metabolism, is perfectly justifiable. The observations which Dr. Black is making apply, therefore, not only to salivary calculi but to urinary and biliary calculi as well, and it is possible that the results which he will obtain regarding the control of calculus formation in the mouth may also apply to calculus formation in the urinary and biliary bladder. He has opened up a great field for investigation and research which may prove to be of inestimable value to mankind. It is to be hoped that others may lend him the aid which they may, in the collection of data and material, until he shall have found the true solution to the problem.

Dr. Edward C. Kirk, Philadelphia:

I had not expected to be called upon to participate in this discussion. I came here to listen and not to speak; to be instructed rather than to attempt to instruct you. But I respond to your invitation to speak on the question because it gives me the opportunity to

pay my tribute of praise and admiration for this wonderful and interesting exhibit which Dr. Black has presented to us. There are one or two points that he has raised which I should like to discuss with him in your presence.

In the first place, if I understand him correctly, in the beginning of his essay he dismissed with a graceful wave of his hand the idea that tartar—salivary calculus—resulted in any way from an interchange or and interplay of chemical affinities within the mouth. I wish he had explained that a little more fully, for while he has dealt very largely with the physical appearance of this deposit, it seems to me that everything he has said indicates that the physical appearances which he has shown to us are essentially the result of the interchange of chemical affinities between the substances involved. I do not quite understand what he meant by that part of his paper and I hope, when he comes to speak in closing the discussion, he will elaborate that point a little more fully for our understanding.

I am impressed, first of all, most profoundly by the wonderful technic which has been exhibited to us here as furnishing data for the puzzling out of this problem, as far as it has been puzzled out. I think anyone who has made any attempt to study the structure of tartar must have realized the tremendous difficulty in producing sections of sufficient thinness to be at all understandable under the microscope. Dr. Black, if he had done nothing else for this subject, has placed us under one other obligation to him of no mean magnitude by having shown how we can get at the material so as to bring it into view under the microscope. Now that we have seen it I want to say something about it. The essayist has referred to the meagreness of the literature on this subject, but I do not find myself in harmony with that view.

Reference was made by the previous speaker to the pioneer work done by that group of Englishmen, Mr. Rainey and Dr. Ord, and incidentally by Harting of Utrecht, who took up the matter much earlier than 1879; I think it was as early as 1858, in a paper which Mr. Rainey presented before the Royal Microscopical Society in England, entitled "Molecular Coalescence," in which the first record was made of the change in physical appearance of certain calcium salts, when these calcium salts were precipitated in solutions containing a colloid substance. Instead of being crystalline in character the precipitate was profoundly modified and was thrown down in little spherical masses. Rainey found there was intimate union between the calcium salt used in the experiment and the colloid material, so that when the precipitate was acted upon by dilute acids he found the precipitate after the acid had removed a portion of the lime salt was highly resistant to the further solvent action of the

acid employed. Because of the spherical appearance of these little masses which grew by concentric accretions to their exterior, as an onion grows by additions to its outside he called them *calcospherites* and the material of which these minute spherical masses containing the calcium salts were composed was the basis of practically all the processes of calcification that were normal to the human body. I think that the prognostication made at that time, further confirmed by the researches of Dr. Ord, have formed the basis of what we know to-day about the normal processes of calcification in the human body. The work of Mummery of London, of Andrews of Cambridge, of Leon Williams of London, and the work of the essayist of this evening, with reference to the study of that tissue, which is on the border line of calcification, especially as related to enamel formation, have shown that the fundamental principles suggested by Rainey and by Dr. Ord and Mr. Harting, were probably correct, because both in the body and out of the body the colloid substances, whatever their chemical nature, whether in the form of mucilage, of globulin, of albumin, of protoplasm, or gelatin, have the property of modifying the character of the precipitate of the calcium salts, and of producing these spherical masses that gradually enlarge, so that various centres of them form and coalesce into these mulberry-like masses that Dr. Black has shown on the screen. It has been my feeling that this fundamental chemical process was at the bottom of this question of tartar formation. I feel that to be true, because it would seem to me extremely peculiar if the concretions in the mouth, involving as they do the same class of chemical substances, were the only known exception to that principle. The exhibit which the essayist has made this evening seems to confirm that view of the case, for they are combinations of calcium salts with colloid materials. Dr. Black has named the colloids in this case, "globulins." That, of course, is a chemical question. The mere appearance of the mulberry-like masses cannot settle the question of the nature of the colloid involved in their formation. If they are globulins, the chemical composition will determine that point, for it is a chemical not a physical question. There is a tendency on the part of the calcium salts to unite with the colloid materials in a more or less definite quantitative ratio, for the reason that if you attempt to act upon the substances—and I am speaking now of the behavior of normal calcified tissue to decalcifying agents—there is a point reached where acid of a given concentration ceases to affect the tissue any further, i. e., it will not extract any more of the calcium salt. I think Dr. Black will agree with that. At that point there is something like a fairly stable union, quantitatively, between the colloid and the calcium salts. But the completely calcified tissue contains lime salts much in excess of the percent. that marks the point where stable union is established and the globulin may take up more and more of the calcified material until calcification of the tissue is complete.

The thing that interested me most was the exhibit of the slide (I cannot call it by number) which was stained by nigrosine. It is a beautiful example of the same thing that Rainey observed and described under the name of "molecular coalescence." My own interpretation of the meaning of that particular clearness of definition, which Dr. Black attributes correctly to a selective stain, is because of the power of that mass of material in varying stages of calcification to take up varying amounts of the stain; that is to say, the mass having various percentages of calcium salts in its make-up absorbs relatively more or less of the staining material and this also is not a physical question, but essentially a chemical one.

I want to speak of the rhythmical or, as Dr. Black expressed it, the paroxysmal nature of the deposit. To me the most encouraging thing he has said about the whole business is the way in which he relates the problem of tartar formation with the question of bodily nutrition. That, I believe, is the crux of the whole business. It is true, and we have seen it is true, for concurrent testimony tends to confirm the idea, that the deposit of tartar is greater on some occasions than upon others. If the finding of Dr. Black is correct, that tartar formation is directly related to the quantity of food taken or more particularly to the kind of food taken, plus is metabolism in a certain type of individual, then we are pretty nearly to the point where we can say that tartar formation is no longer a question of local conditions but rather a local expression of a constitutional condition. That is a point which is of prime importance for us to recognize, and to carry this thought out to its logical conclusion the prophylaxis of the future will not be symbolized by pumice stone on the end of a stick, but it will be accomplished by normal dietetics and normal living.

With regard to the rhythmical character of the deposition, some years ago I wrote one of those X Y Z scientific papers that nobody read, but it is on record. (Laughter.) I called attention to a method of studying the hard structures of the teeth by an optical means which I thought had some value in it, and I still think it has some value in it. By that study I evolved this generalization; given the section of a tooth, representing a section through the enamel, through the dentin, through the cementum, the transparency of the structures of that section under the microscope to polarized light was in direct ratio to the percentage of calcium salts contained in each one of those tissues. Dr. Black does not believe that, but he will come around to it. When you examine a ground section of dentin under the micro-polariscope you will get, not only a histological exhibit of the specimen before you, but if this principle of which I speak is correct, that the tissue is more transparent to polarized light the more highly it is calcified, you then get a chemical

analysis by optical means, and you see a most wonderful thing, viz.: that the dentin, instead of being uniformly calcified, is made up of irregular distributions of lime salts that look like rows of snow-capped mountains, cone-like processes coming up through the dentin structure. The apices of the cones being transparent and shading off optically into the valleys at their bases, are as much like a chain of snow-capped mountains as that section of tartar, dentin and enamel shown to us by Dr. Black is like a beautiful mountain landscape with a lake in front of it.

If my interpretation of that polariscopic picture of the snow-capped mountains in the dentin means that in the apices of the mountains there were more calcium salts than in the valleys, then we have a record of that rhythmical process, that paroxysmal character, in the laying down of the lime salts in the calcified tooth structure. It seems reasonable to suppose that is true. We take into our bodies at intervals a certain amount of food which goes through the chemical laboratory of the nutritonal processes, and in its fully prepared form is ultimately delivered at intervals to the tissues undergoing calcification. It is not a continuous process, but a rhythmical process, and we would naturally expect the protoplasm of the odontoblastic and ameloblastic cells to be engaged in the processes of calcification, not at an absolutely uniform rate of work, but in a rhythmical way as the food supply was delivered to and utilized by them. I think we have much the same condition to deal with in the human mouth with respect to tartar formation. I want to call attention to another point which I think is important to consider in this connection. While it is true that tartar formation takes place in the mouths of excessive feeders, it is also quite true that there are many individuals who overeat who are examples of what we would call plus-nutrition, gourmands, who have very much the same condition of salivary fluids or bodily juices, but who have no deposits of tartar on their teeth at all. I have met these cases, and I think the rest of you have. They eat more than is necessary to maintain the nutritive processes in a state of normal balance. There are people who have tartar formation and those who do not under these circumstances. I am therefore of the opinion that the interplay of chemical agencies in the mouth, due to differences of salivary composition dependent upon the nutritional process independent of the mere quantity of food, is at the bottom of the question of tartar formation.

I am delighted beyond expression that Dr. Black has brought this interesting exhibit before us, and I appreciate the modest way in which he says he has only started upon the question. I think that is true, but I am glad to be able to applaud his efforts when he has made such a brilliant start upon this subject.

Dr. S. H. Guilford, Philadelphia:

When your worthy President took me aside this morning and told me he expected to call upon me as one of the discussers of Dr. Black's paper, I protested that it would be unfair because I had not read the paper and did not know exactly what Dr. Black was going to say; besides, the title indicated a subject not exactly in the line of my studies. He replied that it did not matter so much what I said, he thought the members wanted to hear my voice; so here I am.

I think the Chicago Dental Society is to be congratulated upon its success in securing two such papers as we have heard read last night and to-night. We all know that this society is accustomed to doing big things, but on this occasion it seems to have outdone itself, and those who have come from a distance will realize that they have gained much and have been amply repaid for their journey. We never listen to a paper from Dr. Black without feeling a sort of inspiration. He is a man that has done so many things for the benefit of the profession that we can hardly summarize them, and he is also one who never touches a subject without brodening and illuminating it.

Two thousand years ago people looked to the East for wisdom. To-day many are looking to the West for information, not only the middle West, but the far West—the Pacific Coast—as we realized last evening.

In discussing a paper of this kind we recognize that a scientific essay should be and really is, to a greater or less extent, of advantage to the entire dental profession. I know there are multitudes of dentists who will not subscribe for some dental journals because they consider them too scientific. They do not contain articles calculated to aid them in a material way. This is one feature that has kept us back from realizing our better possibilities. The dentist has long been known to his fellow-men as one who deals with material things; as a man who extracts teeth or fills, or replaces them, but he has never appeared to the public as a scientific man. Now, if we want to make our impress upon the world at large, we must do something more than can be accomplished by manipulative efforts. We are at the present time, perhaps, emerging from a condition which has prevailed, and there is opening up to us an opportunity such as we have never known before.

Many years ago I listened to an eminent medical man in the City of New York, who said on that occasion: "The objection we have to the dental profession is that its members have never done anything for mankind in a general way. In other words, they have never striven to benefit those who could not pay them for their services." He said: "We have hospitals, we have clinics, we serve the

poor, but what has dentistry done?" Of course such statements hurt our feelings, and probably all the more so because they were true. He was not entirely disingenuous in his remarks, however, because we know that while the physician gets credit for doing a great deal of charitable work, it is done in many cases not simply for the sake of charity, but for the purpose of benefiting the individual physician himself. The physician, no matter what department of medicine he is engaged in, absolutely requires a hospital and a clinic in order to give him the variety of cases and variety of experience which he needs to constitute himself a successful practitioner. At the same time, however, we certainly have not done our part. But to-day, with the new field of Oral Hygiene opening up, we have an opportunity to do something for the world, and we are grasping it. The public service idea has spread almost like wildfire, not only over this country, but other countries, and our opportunity is before us. If we endeavor to do our best in that respect; if we are willing not only to serve the public without remuneration but to teach them how to serve themselves, how to benefit themselves, how to preserve the health of the teeth and the oral cavity, we will be doing a service to humanity; one that will reflect credit on us perhaps greater than that which is reflected upon the medical profession, because we have nothing to gain by it individually. What we do in that direction is done entirely in an altruistic spirit, absolutely for charity and nothing else.

In the matter of scientific investigation there are men qualified to do scientific work, and yet the great majority are not qualified by education or by disposition to do it. I confess I belong to the great majority; yet at the same time everyone has his sphere. Possibly you may remember the verses written by Rudyard Kipling and dedicated to the late Admiral Evans, in which he said:

“ Zugbaun draws with a pencil,
And I do things with a pen;
But you sit up in a conning tower
Bossing eight hundred men.”

Each one of us has the ability to serve in some way, and while Dr. Black does not spend his time in a conning tower bossing eight hundred men, he is working in his laboratory and inspiring the entire dental profession, and I am sure if there is any desire near to the heart of Dr. Black it is that the younger men of the profession shall turn their attention to scientific investigation, take up the work as he shall leave it, and carry it forward.

I know that is his wish and if benefit can come from such work, there is no reason why dentistry should not take a great stride forward. If that is done, and if some of the younger men will turn their attention to real scientific investigation, I believe the thing that

will most inspire and encourage them is the fact that they have had the example and the influence of a man who, through his tireless energy and absolute unselfishness, has worked for the good of the profession; a man who has done more for the good of humanity through the advancement of dental science than any man who has ever lived—Dr. Black.

Dr. John M. Gilmore, Chicago:

I believe that a great deal of time is wasted upon scientific research and scientific investigation, and not enough attention paid to the things as we see them in our everyday practice.

In the admirable paper presented by Dr. Black this evening, illustrated by numerous slides, your attention was called to the paroxysms of deposits of salivary calculus, and that these paroxysms of deposits occur after every good meal, why is it, may I ask, that so many people who indulge freely in the good things of life are entirely free from deposits and even those having deposits are not so overburdened with them as we might expect from the essayist's conclusions?

Tartar collects and agglutinates on the teeth only where it is invited and the surface well prepared for its reception, and to fill a depression left by the recession of the gums. A patient visits your office with a goodly amount of tartar upon the teeth. You remove the deposits and a gap is left between the gingival margin of the gums and the hard tissues that were once filled with gum tissue, and when you saw it, with tartar. At the end of a few days the space left between the teeth and gums is filled up. With what? With food. And unless this food is mechanically removed, it permanently remains, gradually undergoing chemical change, animal and vegetable matter giving place to the mineral deposited through infiltration, getting firmer and firmer until it is called by the misnomer, "salivary calculus," for I believe the greater part of the mineral deposits come from the food and drink directly rather than through the saliva. Note here, also, as soon as the vacancy is filled the tartar paroxysms cease. When a plate is worn in the mouth that does not coaptate with the surrounding tissues, nature fills the vacancies and again deposits cease.

I believe Dr. Black is right in saying that deposits occur more profusely after partaking of a superabundance of food; but what of it? The harm to the individual does not come from the formations, but from the neglect or inability to restore normal conditions.

When an individual presents himself to you with a perfect set of teeth and gums perfectly intact, clinging so closely that the thin edge of the gum tissue seems, if possible, to grow out of the very

enamel and the gum septum fills the interproximal space perfectly and rigidly to the point of contact there is no chance here for deposits. Before deposits begin to form on such an individual's teeth, a slight loosening of the gum tissue around the cervical margin and a softening of the gum septum must occur, thus inviting foreign matter to adhere to the rough surface and fill the gap prepared for it; when this is filled further deposits cease and is only added to by further relaxation and recession of the gum tissue. The amount of tartar is governed by the amount of relaxation and dissolution.

Deposits upon the teeth are looked upon as the cause of diseases of the gingivae. I believe this is erroneous and deposits in themselves are not only harmless, but acts as a friend rather than a menace to the sickly margins, guarding, and preventing their more rapid destruction by the impact of food in the course of mastication. If the deposits are timely removed and the gums massaged and restored to their former tonicity we need not look for their recurrence; but, if neglected, bacteria will congregate underneath and aid in the destruction of more tissue, hence inviting additional accumulations, or the formation of pockets down the side of the root, or both.

In treating cases with large deposits and consequent much recession and inflammation, I believe it much better practice not to be in too big a hurry removing these deposits. Much better work in curing the pockets and in the restoration of tissue can be accomplished by removing the soft accumulations and restoring the tone of the soft tissues by the hot water massage, and even treat and cure the pockets before removing the occlusal part of the hard deposits, because if these deposits are removed in toto, as is customary at the first sitting, there is nothing left to protect the soft, inflamed and bleeding margins against the stress of mastication, and as a consequence have much greater loss of tissue, also more room for larger secondary deposits and greater difficulty in preventing their formation and in the restoration of lost tissue.

In reference to the remarks made by Dr. Kirk, I believe prophylaxis will be taught later on as one of the essentials in our mode of living. The mode of living has a great deal more to do with dental caries and pyorrhea than any of us are aware. If we live properly and are careful about our habits, there is no reason why we should either have caries or pyorrhea. And the best treatment we can afford our patients is to educate them to guard against these diseases by proper living.

Dr. William Conrad, St. Louis, Missouri:

I gives me great pleasure to say that I came to this meeting this

evening for the sole purpose of hearing Dr. Black's paper. I listened attentively to every word of it. He is a man of such great talent that he leaves an inspiration for closer observation, if not for more study.

Speaking of oral and dental prophylaxis, I was very sorry to hear that distinguished dentist from Buffalo (Dr. Low) make the remark he did. In the newly erupted first molars he said he could take care of the decay. It should never be that. Decay is an absolutely unnecessary part of the human mouth. I have extended an invitation to many of you gentlemen from time to time to come to St. Louis and spend a week or a month with me, at my expense, and I believe you will go away convinced. This wave of oral and dental prophylaxis that is sweeping over the country is going to make many, many skilled experts; not only that, it is going to make a very great advance in the practice of dentistry, and I believe that any man with an ordinary intellect can outline what will follow certain conditions for ten years to come; and the day will not only come when the dentists will be better, but when the state and city authorities will be compelled to keep the mouths of the indigent poor in perfect order. You cannot have a compulsory educational law up to fourteen years of age, with a complete system of police to enforce it, unless you keep these people in a condition so that they can obey the law.

Dr. George W. Cook:

I have done some studying along the lines indicated by Dr. Black this evening, but have come to somewhat different conclusions as to my interpretation of the conditions he has described. I would like to have had the opportunity to point out from his slides some of the conditions I have observed that have seemed to me to be somewhat different from those he has mentioned, but as the hour is so late I will not attempt to do so. These studies are of great interest to us as a profession, and I hope great good will be the outcome of them.

Dr. Thomas B. Hartzell, Minneapolis, Minnesota:

When such eminent men as Dr. Black and Dr. Kirk discourage you in keeping your mouths clean by prophylactic methods, I think they have left an impression on your minds that they really did not intend to leave. We all know that the bacterial flora in the mouth is very rich, and that the men who are using orange wood sticks and various methods of keeping the tooth surfaces free from accumulated bacteria that gather there should not be discouraged in their efforts in the direction of mechanically eliminating a large amount of bacterial growths. They should keep on. They are not doing

harm. Most of them are teaching a lesson in mouth sanitation, showing patients where the deposits are, and in removing the deposits, they are at the same time getting rid of many harmful bacteria. We will all hail the day when we can give up our present laborious methods for those advocated by the essayist. In the meantime let us not neglect prophylaxis.—*The Dental Review*.

THE CLINIC OF THE NATIONAL DENTAL ASSOCIATION.

THE Clinic Committee desires to extend to all members in good standing of all dental societies a cordial invitation to attend and to clinic at the "all day" clinic of this Association to be held at the New Willard Hotel, Washington, D.C., Friday, September thirteenth. The enormous ball room, top floor of this hotel, has been secured, and the management promises us every convenience.

We wish particularly to call your attention to the classifications of the different clinical material, where every effort will be made to arrange the different events according to title and in sequence so that the various phases in any operation may be seen at a glance, without the usual regard to chair or table, this will avoid confusion and save time, allowing the members to select and study favorite subjects without hunting all over the room.

From the material now in hand your committee can promise a large and varied clinic, that we may assemble all clinicians' names and titles for the preliminary programme, kindly reply at once to Clarence J. Grieves, Chairman Clinic Committee, Park Ave. and Madison Sts., Baltimore, Md. A. O. Ross, Vice Chairman, 807 N. High St., Columbus, Ohio.; S. W. Bowles, Secretary, 1616 I, Washington, D.C.; W. R. Clack, Mason City, Iowa; A. P. Burkhart, Auburn, N.Y.; J. T. McClenahan, Washington, D.C.; W. D. Tracy, New York City; George E. Savage, Worcester, Mass.; John H. McClure, Wheeling, W. Va.; J. E. Chace, Ocala, Fla.; E. L. Pettibone, Cleveland, Ohio; H. J. Allen, Washington, D.C.; W. R. Wright, Jackson, Miss.; C. A. Lundy, Los Angeles, Cal.; S. H. McAfee, New Orleans, La.; C. M. Barnwell, Atlanta, Ga.; Richard L. Simpson, Richmond, Va.; W. H. Scherer, Houston, Texas.

AIR.

BY LYMAN B. JACKES, TORONTO.

Editorial Department, Canadian Engineer.
(Written for Oral Health.)

THERE is probably no common material with which mankind generally is so unfamiliar as the atmosphere. This great belt of mingled gases that surrounds the planet on which we live is the most important factor in the chemistry of life as we understand it, and it is to a short examination of the subject that this article is written for the readers of "Oral Health."

In years gone by people acknowledged the presence of the air in a similar manner to the recognition given to water; that is, the composition or its important functions in the physical economics was absolutely ignored until the time of Black, a Scotch chemist, and Lavoiser, a Frenchman, who gave us our first rudimentary knowledge of the atmosphere and overthrew the old theory of "phlogiston" and demonstrated that the air contained oxygen. Then came the discovery of nitrogen and gradually the rough aggregate of the atmospheric contents were known. For many years scientists thought that the air was a conquered field and that it was useless to expend further time on the examination of the subject, but there is always one member of an organization or party who, although adhering to the general principals of the society, still holds diverse views on subjects that the main portion of the members are satisfied with. The general theory regarding the air proved no exception, and during the latter part of the century just past, Sir William Ramsay announced his discovery of argon, helium, neon, krypton and xenon, and the scientific world of to-day awaits the discoverer of a means whereby nitrogen may be split up into two or more unknown elements.

Chemically, disregarding the rare elements mentioned above, the air is composed of an almost uniform mixture of nitrogen 78% and oxygen 21%, and this mixture always carries a certain amount of impurities and moisture.

Following the irrevocable law of nature that nothing be wasted, these impurities are used in the realms of nature for many and varied purposes, but it is the artificial exclusion and elimination of the impurities and poisons that are beginning to attract the attention of the mechanically inclined as well as the parties following callings usually classed as professional.

For many years there was an industry in the city of Toronto that had an office in the business section of the city. The peculiar nature of the company caused a large number of persons to enter and leave the premises on a fixed day each month. As the windows in the winter months were seldom opened the atmosphere of the room was at times "slightly heavy." The precise condition of the air may be best exemplified by the statement that about ten thousand persons would enter and leave the office between the hours of 9 a.m. and 5 p.m., each person would stay on an average about two minutes and then leave by a double door that practically did not allow of a draft to circulate.

About the middle of December, 1910, following an unusually heavy day, I made a quantitative estimation of the CO_2 present in the air by means of the familiar oxalic acid and barium hydrate method whereby the CO_2 is calculated from the barium carbonate formed according to the formula

$$\frac{A \times B}{C} = X$$

where A is the volume of oxalic acid equal to the volume of CO_2 and B is a factor (100) used for the percentage calculation, and C is the actual contents of the jar used for the determination after correction for temperature and barometric conditions. The result of the test in the room mentioned above showed a percentage of CO_2 equal to 30 parts per thousand which exceeds the limit of von Pettenkofer by about 66%. Von Pettenkofer asserts that the CO_2 in a room should not be raised above .1%.

The condition of the air in the room mentioned above had been so for a number months and the result was numerous complaints from the customers and sickness and indisposition among the clerks.

One day an engineer called upon the management and submitted plans for a forced draught system of ventilation. The system was, in due time, installed, and to day a more pleasant office to enter could not be found. Two large electric motors draw the fresh air through a warmer and force it into the room through a screen in the wall toward the rear. An examination of the air now under similar conditions is impossible, owing to a change in the manner of conducting the business.

Another important factor in air purification is a peculiar form of oxygen known as ozone, and although several attempts have been made to utilize this factor, it may be safely said that success has not to any great extent rewarded the investigators. Ozone owes its remarkable sterile properties to the fact that it contains, according to chemists, one extra atom per molecule of oxygen over ordinary oxygen and that this extra atom will readily combine with oxidizable substances and render them harmless or less active.

The winds and draughts of the air belong to the study of meteorology, but there is one phase of this science that must be touched before a discourse, however imperfect, could be concluded.



There has recently appeared in print an article by J. Gordon Ogden, Ph.D., entitled the "Right Hand Of Death," and in this article the writer points out that the powerful destructive forces of death are not due to disease, but to dust and the air currents that carry the deadly atmospheric bacteria. The powers of air to carry disease may be tangibly shown by referring the reader to the two small illustrations accompanying this article. A is a petrie dish properly flooded with nutrient gelatin and exposed on the window shelf of a lecture hall about one hour before the arrival of the audience. B is a reproduction of a second plate exposed under the same conditions, except that the exposure was made as the audience had left the hall and the warm draughts of air were allowed to rush out through the open window and deposit their bacteriological contents on the soft culture media. At a future date it may be possible to continue this article with illustrations collected from other sources that will tend to show the possibilities of disease transportation by this means.

NERVES IN THE DENTINE.

THE Royal Society has accorded to Mr. Howard Mummery's paper the honors of publication "in full" for his important demonstration of the innervation of dentine, and well has he deserved it. Oddly enough, "the tooth" has been for a long time regarded as a thing apart in the human economy, a sort of ugly duckling in the family of the members. Far be it from us to strain a metaphor, but in very deed "the tooth" seems capable of developing, in some other respects, into a very ugly and even alarming duckling.

That things dental should so particularly point to specialism as to demand special qualifications and special laws is quite interesting, but interest becomes amazement when we find "the eternal tooth" has not only its own curriculum and its own laws, but even its own histology. It seems as though Nature had recognized and acquiesced in the demands of the ugly duckling. At last, thanks to Mr. Mummery, we are delivered from one absurdity; we are no longer obliged to teach that a highly sentient tissue is devoid of nerve supply or that a complicated and elaborate network of nervous distribution ends in nothing but loops. The dental pulp, we were taught a few weeks ago, was full of nerves and devoid of any representatives of the lymphatic system. It was encased in a covering of dentine which, although very capable of transmitting sensation, was unsupplied by nerves, outside which was an arrangement of inorganic crystals, the product of the activity of protoplasmic cells, but alone of all organic products devoid of organic matter. Travelling from within, outwards, it was a pantomime followed appropriately by a harlequinade. The lymphless pulp, the nerveless (but sensitive) dentine and the inorganic spar on the outside were gloriously unique in the world of biology. Mr. Howard Mummery has now destroyed one of these unnatural superstitions. He has stained the prolongations from the plexus of Raschkow with many impregnations and other stains; he has used most recent methods in preparing his sections, decalcification as well as the Weil process, and always with the fine adjustment and the high power the nerves are plainly traceable as lines of fine dots passing from the plexus of Raschkow through the second plexus (which we are tempted to christen the plexus of Mummery), to the uttermost limit of the dentine. Two of these lines often accompany a single fibril. Mr. Mummery's observation does not rest upon a few sections or a favorite method of preparation or staining; we have ourselves examined hundreds of

his sections of varied preparation and staining and these constitute only a few chosen from a mass of evidence. Several of the ablest accessible histologists have examined the slides, and have fully acquiesced in his conclusions. The Royal Society has placed its *imprimatur* on his work, and now we may tender him our thanks, coupled with the fervent hope that the day may not be far distant when the rest of our histology may be brought into conformity with that which obtains in other parts of the human body.—*British Journal of Dental Science*.

DENTAL PROPHYLAXIS IN CHILDREN.*

BY J. A. BOTHWELL, L.D.S., D.D.S.

Dental Surgeon to the Hospital for Sick Children, Toronto.

PROPHYLAXIS is the art of preserving from or of preventing diseases. It is not a curative, but a preventive process.

From a dental standpoint, prophylaxis is considered an elementary operation, and is necessarily so because it is the first operation when patients place themselves under our care for treatment—the alleviation of pain only being excepted. It is important to make this a very thorough operation.

Caries or decay is the result of non-prophylactic measures. It is caused by the formation of gelatinous plaques on the surfaces of the teeth. These plaques protect the bacteria and enable them to dissolve out the lime salts between the enamel rods of the tooth and finally break down the enamel rods themselves, producing cavities.

The first requisite for prevention is a healthy, perfectly formed organ, one which has all the virtues of good articulation, ample blood supply, and normal environment. Too little attention has been given to the early habits of mastication as well as the character of food which the children receive from the age when permanent molars begin to erupt. There can be no development without a proper and adequate blood supply. This cannot be had without proper exercise, and this exercise will not be had until the children are taught to thoroughly masticate good hard foods instead of the soft preparations usually offered them.

(*Read Before the Pediatric Section of the Academy of Medicine, Toronto.Q

The immediate effect of such exercise is to increase the circulation in all the surrounding tissues insuring a better growth, a more resisting organ, and a healthier action of the salivary and mucous glands. The ordinary diet contains a sufficient amount of calcium salts and other ingredients to form a perfect set of teeth if it could only be properly placed, but how can the child masticate its food if the deciduous teeth are defective. Not only are they unable to do so, but habits are being formed which cling to them long after the loss of the deciduous teeth. This constitutes a demand for more careful attention to childrens' teeth.

All investigations point to vitiated oral secretions as a prime factor in dental caries. Correct the secretions and preserve the teeth. When we are able to determine a normal saliva we will have made a big stride forward.

Frequently we find cases among children of certain ages with a vitiated saliva, where decay is rampant. This condition is easily detected by chalky milk white spots on the enamel, and may usually be remedied by a prescription supplemented by prophylaxis.

Micro-organisms are to be constantly combated. Can the oral cavity be made sterile? Most certainly not, but we can reduce the numbers and activity of the micro-organisms by limiting their food. An intelligent appreciation of this fact will do much to establish the daily routine of careful mechanical removal of all traces of food with brush, dentifrice, floss, silk, etc.

Cleanly habits are part of the education of every individual and can be formed best in early childhood. The mouth is the gateway through which all food must pass on its way to body, and too much stress cannot be bestowed on this important subject of oral prophylaxis for the sake of the little ones. A little water used frequently for rinsing with a motion of the tongue on all surfaces of the teeth and gums, lingual, palatal, labial and buccal, goes a long way to assisting in this prevention, and this prevention should be our highest aim.

Salivary calculus and green stains, the latter of which is most common in children, when the mouth is open will disgust the beholder, and frequently prevent the formation of a favorable opinion of the child who is so neglectful of his or her appearance. Nothing adds so much to personal appearance as a clean set of teeth. As an example to our patients, how necessary it is then for a dentist or medical man to present a clean set of teeth at all times.

Germicidal mouth washes are very much over-estimated because they are usually in the mouth such a short time and so are practically useless. Their principal virtue is that they are an incentive

to the patient to clean the mouth because of the pleasant taste.

From the earliest days down to the present time in the human race, men have searched for the spring of health, hoping thereby to find some source of eternal youth. Our patients come in the same manner asking, "Doctor, what can I do to make and keep my teeth clean, and preserve them from decay?" This question comes over and over again. We would gladly write a prescription if such were possible, but there is no specific.

Sometimes a dentist does prescribe a wash and gives instructions with it. What is the result in a large majority of cases? The patient forgets the instructions and uses the wash thinking he has a specific without labor, but in a short time he finds dire results. Every wash should be accompanied by careful instructions as to its use, which should be minutely followed. They are usually prescribed in cases of inflamed mucous membranes and gum tissues where the inflammation does not subside even after the irritant has been removed. They should be used only for a short period, for in a few weeks they lose the desired effect on the tissues.

Tooth pastes and powders are valuable in the cleansing of the teeth and mouth and particularly so if the saliva is inclined to be sticky or ropy. They should contain a reasonable amount of fine grit—preferably a grit soluble in the fluid of the mouth. A small amount should be placed upon the brush in the cleansing process. One should see to it that all particles of paste or powder are entirely eliminated from the mouth by thorough rinsing afterwards with pure water.

Tooth brushes should be of the proper size and shape so that one may cleanse every surface of every tooth of both jaws. In the majority of mouths two brushes at least are necessary, a labial and a lingual brush. For children under seven or eight years of age, a small brush with one row of bristles, as the "Hutax" child's brush, is strongly recommended. For all over that age I think there is none better than the medium size Hutax brush for all labial surfaces and the lingual brush for lingual surfaces. I have used a great many different brushes and have yet to see one that can compare favorably with the Hutax. They are properly shaped so that every surface of every tooth may be reached.

I saw an article on oral conditions read before this Society in October in which the writer suggested three ways of remedying evils he perceived in the use of a tooth brush for many mouths.

1. All tooth brushes should be boiled before and after use for five minutes.

2. Use a new tooth brush every day.

3. Rinse brush in trikresol 1% or stand in formalin 10%.

In the first place the boiling of the brush is impracticable or would soon destroy it. Secondly, a new brush every day is too expensive for the average person, and thirdly, the soaking in solutions would destroy and soften the bristles to such an extent that they would not do their work any great length of time. However, as we are immune to our own bacteria, we need not be alarmed, and if our brush is given a chance to dry between usages, the bacteria do not get much chance to grow as they need moisture, and the bristles being dry will be stiffer and better able to do their work. I strongly recommend the use of three or four brushes for each individual to be used consecutively, so that a dry brush is always ready for use. They will last longer if so used and so ultimately cost less. If only one brush is used, it should be stood on end in a good place to dry quickly so it will be always ready to do its work. A soft, flabby bristle cannot do good work.

The teeth should be brushed from the gums down over the crowns of the teeth so that the bristles extend well in between the proximate surfaces. If this is done on the labial, buccal and lingual surfaces, together with the thorough rotary brushing of the occlusal or grinding surface, every surface of every tooth will be pretty thoroughly cleansed. This cannot be properly accomplished in less than from three to five minutes.

The teeth should always be brushed upon rising in the morning, so that the bacteria that have developed during the night may not be taken into the stomach with the breakfast. Brush after each meal. It is very important to brush the teeth before retiring so that no particles of food will have a chance to lie around the teeth and ferment, thus giving the bacteria a good opportunity to set up caries.

The object of all this care is primarily to save the teeth, secondly, to prevent infection in the alimentary canal, and thirdly, to prevent the spread of infectious diseases. We are told that 95% of all tuberculosis infections take place through diseased or ill-kept mouths. The same is true of almost all other contagious or infectious diseases.

Besides these diseases such conditions as enlarged glands, inflamed tonsils, septic catarrh of the stomach, indigestion, pernicious anemia, deafness, and many other serious conditions are directly or indirectly traceable to unsanitary mouths.

I have been requested also to say something about the examination of children's mouths, but can only lightly touch upon it here.

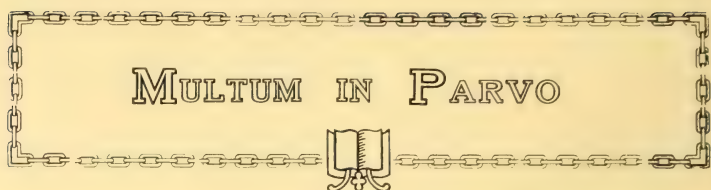
In the examination of children's mouths, or in fact, any mouth, it is well to have a routine to follow. In this connection the following order is good: Lips, cheeks, mucous membrane, gums, general condition of mouth, clean or unclean, abscesses, regular or irregular teeth, number of temporary teeth, number of permanent teeth, and finally, cavities in temporary and permanent teeth. This becomes a habit with the dentist and he sees practically all at a glance.

Here we might note that in all children of six years and over, we are almost sure to find permanent teeth, and these should have special care in examination, as they are likely to be on duty a long time. The tooth which is so often lost, is the first permanent molar. It erupts at six years of age immediately behind all of the temporary or milk teeth. It has five prominent cusps, three in the occlusal surface next to the cheek and two on the occlusal surface next the tongue. It has a solid color as compared with the temporary teeth which are somewhat of a dead white.

When one has several patients to examine, it is a good rule never to touch the body or face, and particularly the mucous membrane of the mouth with the hands lest infection be transferred from one patient to another. Physicians are not always, I fear, as particular about this matter as they ought to be. I have seen physicians on several occasions insert their fingers in the mouths of several children and never wash their hands during the whole examination.

To avoid this very bad practice, one can make a very fair examination with only a flat wooden tongue depressor such as used in the hospitals. Usually in ward use where more than one patient is examined, I use two mirrors, 10% formaldehyde, sterile water and tongue depressors. One mirror is kept in the formaldehyde while the other is being used in the examination of one child, about five or six minutes. The water is to wash off the formaldehyde before being used again. A tongue depressor is used only once and goes to the pus basin to be destroyed.

Any inflammation of the mucous membrane is quickly noticed. Green stains and other stains are easily recognized, and decay in the teeth is usually marked by a hole in the tooth or dark black area on the surface. In closing, I hope that this paper will give every man present a few real practical working points. I thank you for your kind attention.



This Department is Edited by C. A. KENNEDY, D.D.S.

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Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

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COMPARATIVE EFFECTS OF GENERAL ANESTHETICS ON BLOOD CHANGES.—In a comparison of the three most popular anesthetics in regard to blood changes, we conclude that nitrous oxid causes no permanent effects of any significance. Ether causes more harmful effects, consisting in slight anemia and marked decrease in coagulating time. Chloroform causes the most harmful results, i.e., hemolysis and production of distinct anemia.—*A. D. Bevan, Journ. of Amer. Med. Association.*

REPAIRING A BROKEN FACING WITHOUT REMOVING A BRIDGE.—

This method consists in selecting a plate tooth of the proper size, grinding off the flange so that it will be flat like a facing and cutting off the pins and using a little articulating paper on the side where the pins are cut off. This is pressed in place and will mark the pins that are in the bridge on the tooth to be replaced. With a carborundum disk a slot is cut wide and deep enough to receive the pins. The fitting, with the articulating and grinding in place, is continued until the tooth fits the bridge backing correctly. It is then cemented in place, constituting a very substantial repair.—*J. E. Metcalf, Dental Summary.*

STABLE SOLUTION OF COCAIN.—The following formula is recommended for obtaining a stable solution of cocain for dental purpose: Cocain, 10 parts; phenyl acetate, 50 parts.—*Pharmaceutische Centralhalle, per L'Odontologie.*

HEATING GUTTA PERCHA.—While it is common to see a dentist hold gutta-percha in the flame of an alcohol lamp or Bunsen burner, this is a very poor method, because of the danger of overheating and thereby destroying the lasting qualities of the material. Gutta-percha is best softened on one of the heaters made for that purpose, of which there are a number on the market.—*W. B. Tyrell, Odontologist.*

VARNISH FOR PLASTER IMPRESSIONS.—In casting plaster impressions, use a solution of sodium silicate and ammonium hydroxide, equal parts, and colored with carmine for painting the impression. This forms an excellent separating medium and the color clearly defines the two parts, model and impression, and warns one of the proximity of the model when breaking away the impression. Soap as a separating medium should not be used, as this is liable to leave many minute bubbles in the model.

CARE OF HYPODERMIC SYRINGE.—This little instrument should never be allowed to become dry, this evidently being the cause of the annoyance which you experience. As a preventive, put a few drops of glycerin in the syringe after using it; this will keep the leather soft and will act as a lubricant to the instrument. In case you neglect to do this and the leather is dry, soften it by immersing in cold water (never in hot water for this purpose), then allow it to remain in a glycerin bath for some time.—*Dental Brief*.

DENTAL ODORS.—Drug odors add to the office, in the mind of many sensitive patients, still more repugnancy than they already have from fear. It is my habit to spray a weak solution of spirits of lavender, fumigating, so to speak, the entire breadth and length of the operating room. Compressed air does this admirably; the room smells sweet and fresh and the air is by far more agreeable.—*Geo. Zeduhanne, Dental Digest*.

SOAP IN POLISHING RUBBER PLATES.—A cake of ivory or other fine soap is a help when polishing vulcanite. It is wetted and pressed against the felt wheel before applying the pumice stone. It acts as a lubricator, holds the pumice stone to its work, saves time, and produces a finer finish.—*Dental Brief*.

THE FIRST PERMANENT MOLAR.—When cavities are found in the crowns of the first permanent molars, shortly after eruption, it is advisable to fill with a high-heat gutta percha if the patient is very nervous and afraid of pain. This will last until the patient can bear more thorough preparation of the cavity.—*Items of Interest*.

FILLING THE HYPODERMIC SYRINGE.—Drop a small piece of absorbent cotton into the fluid to be drawn into the syringe. Press the syringe against the cotton, thus filtering the solution; there will be no specks to stop the syringe and less risk of after-irritation.—*Welch's Dental Magazine*.

CLOUDED MOUTH MIRRORS.—It is often a great nuisance to find your mouth-mirror clouded with moisture during the commencement of an operation. A little soap rubbed over the surface of the mirror and immediately wiped off quite prevents this.

VARIATIONS IN THE OCCURRENCE OF NITRITE IN THE SALIVA.—Laboratory tests on the variations of the occurrence of nitrite in the saliva justify the following conclusions: Nitrite may be diminished in quantity in the saliva or wholly removed from it by oral micro-organisms. The natural diminution in the quantity of nitrite in saliva, or the complete removal of nitrite therefrom, may be due to enzymes, eliminated by oral micro-organisms, but such effects are also attributable to intra-cellular influences exerted by these organisms. Neither the occurrence nor the proportion of nitrite in a specimen of saliva is an index of the existence or degree of a given case of dental disease, or of the rate of its progress.—*C. S. Smith and E. W. Baker, Journal of Allied Societies.*

GLASS-STOPPERED BOTTLES FOR VOLATILE SUBSTANCE.—When volatile substances are placed in glass-stoppered bottles the ground portion of the stopper should be moistened with glycerine. This not only makes a more effective seal, but prevents the stopper from sticking.—*Dental Record.*

In finishing the occlusal surfaces of gold fillings and gold inlays, it is often difficult to obtain a good finish in the cunei between reproduced cusps. The very next time you have trouble in this respect try a Robinson's cup-shaped brush wheel with plenty of wet pumice, run the brush wheel until the surface is dry and lustre appears. If a few scratches still remain do it again, and follow this with wet whiting in the same manner.—*F. J. Yerkes, Minneapolis, Minn.*

A DENTIST'S DUTY.—It is the duty of every dentist to relieve pain and not to cause it. Every woman who finds herself pregnant should visit her dentist, tell him her condition and place herself in his hands to do whatever work he finds necessary to be done. We should take special care to avoid giving her pain at such a time, not because it would be hazardous, but for the necessity of not shocking her nerves any more than possible on account of pre-natal impressions as aforesaid.—*J. G. Winters, Review.*

INFLUENCE OF CHEWING ON THE CONDITION OF THE TEETH.—Investigations on the children in the town of Kotzling, in Batavia, showed that of those who eat hard bread the percentage with bad teeth was 6.9; of those who eat hard and soft bread, 8.2; of those eating only soft bread, 10.5. In the town of Shringen (Baden) the percentages before and after the introduction of soft bread were as follows: In 1894, when only hard bread was eaten, 12.4 per cent.; in 1897, just after soft bread had been introduced, 12.9 per cent., and in 1901, when most of the bread consumed was soft, 20.9 per cent.—*The Dental Record.*

A COMMON MISTAKE.—In many mouths, where teeth have been lost, extensive fillings inserted, and sometimes several crowns used, the case later demands attention, and the common mistake is made in treating the case with regard to the individual tooth rather than a consideration of the general condition resulting from former dental operation. These cases demand a treatment from a broad basis and a general view point that will restore the upper and lower arches to as near as possible, their former relation to each other as well as their greatest usefulness in mastication.—*W. D. N. Moore, Chicago.*

THAT WORD "CANINE."—Messrs. Editors, Text-Book Writers, Lecturers, etc., why not discontinue from your vocabulary the word "canine," as applied to the human teeth? Imagine a dentist talking to a young lady about her beautiful teeth, described by Dr. Allport as "when beauty sits enthroned upon her ivory throne"—and tell her she has canine teeth. No, it's too "dog-on-it" bad to apply the name of a brute's tooth to the beautiful human tooth.—*L. P. Haskell, Review.*

GOOD ADVICE.—When your regular hours are comfortably filled and there is still an increasing demand for your time, do not increase your working hours, but increase your fee per hour. You may lose a few patients by doing so, but as your time will still be filled at a higher rate you can well afford to.—*F. C. Brush.*

BROACHES IN ROOT-CANAL TREATMENT.—If a tooth requires root-canal treatment, a smooth broach may be used instead of a barbed one, passed through the flame of the alcohol lamp, touched with a piece of sticky wax, and wrapped with the cotton. To remove the cotton, the broach is passed through the flame again, when the cotton can easily be rubbed off.—*British Dental Journal.*

THE SALIVA AND THE TEETH.—Dr. C. Risa has been able to confirm the views of other investigators to the effect that there is a distinct relationship between dental caries and the alkalinity of the saliva, and that a high alkaline reaction constitutes the best means of combating the development and progress of caries.—*The Lancet.*

OHIO STATE BOARD OF HEALTH AND SEX HYGIENE.—The Ohio State Board of Health has drafted a bill providing for education of the young in matters of sex and this will be introduced at the coming session of the legislature. This is the most radical step in the direction of social hygiene ever taken by public health officials and is the initial effort to make practical a theory that is becoming widely accepted as being of paramount importance from the viewpoints of health and morals.—*Public Health Journal.*

ORAL HEALTH.

EDITOR — — WALLACE SECCOMBE, D.D.S., TORONTO, ONT.

ASSOCIATE EDITORS

{ GEORGE K. THOMSON, D.D.S., HALIFAX, N.S.
W. H. DOHERTY, D. D. S., TORONTO, ONT.

A Monthly Journal devoted to the interests of the Dental Profession, and to the furtherance of Public Health through the education of the Public in relation to Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

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Vol. 2

TORONTO, MAY, 1912.

NO. 5

EDITORIAL.

DENTAL COLLEGES AND THE UNIVERSITIES.

THE Maritime Dental College has recently been organized as an independent Faculty of Dalhousie University. The progress of this college has been a credit to the dental profession in the Maritime Provinces. The development of dental education in Nova Scotia has been such as to bring credit to the men of faith and large vision, who have borne so successfully the great responsibilities placed upon them.

Oral Health sincerely extends to Dean Woodbury and the Dental Faculty of Dalhousie University its heartiest congratulations and wishes the new dental department the greatest measure of success.

To be reminiscent, there was a time when medical colleges thought that dentistry had no part with them. There was a time too when universities felt that dental education was entirely foreign to the activities that properly fell within the sphere of the university. Those days are past.

There also was a time when the dental profession looked upon recognition by a university as an important factor in establishing the status of the profession. The status of the dental profession to-day is established beyond peradventure. Its future will be just what the members of the profession make it—no better and no worse.

Quite a number of the American universities have already established dental faculties. Such an arrangement places the management of dental education in the hands of the university. Most dental colleges, however, are merely affiliated with a university which gives all the academic advantages, but leaves the entire control in the hands of the college.

When a college is confronted with the problem of accepting or rejecting a proposition to become "a full fledged faculty" of a university and the problem of finances be not involved, the question narrows down to one of efficiency. Will the college be more efficient under the control of the university or the profession?

The day is past when the "status" of the profession need be considered either one way or the other. The problem must be solved by each individual college, having regard to the conditions and needs in its own particular case.

The Maritime College will now have the strength and resources of Dalhousie behind her. This is an arrangement which we believe under the circumstances will prove of great advantage to both the Maritime College and Dalhousie.



Nice for Bill Head or Advertising.



THE above illustrations are a few that may be found in the advertising pages of certain dental magazines. The cuts "nice for advertising" are advertised for sale at so much each.

Is this not one argument of the many for a purely professional literature?

ATTENTION is drawn to a paper in this issue by Dr. G. V. Black, upon the subject of "Deposit of Salivary Calculus." This subject is of the greatest importance to both the medical and dental profession. The paper (with discussion) has been published in full, because of its supreme interest and unquestionable scientific value.

The article is published through the courtesy of *The Dental Review*.

HOW MANY?

HOW many dentists realize that oral hygiene is important as a health question even after the teeth have been extracted?

How many dentists give patients proper instruction for the cleansing of artificial dentures?

NEGLECTED TEMPORARY MOLARS, A LAST RESORT TO
AVOID EXTRACTION.

IN the mouths of neglected little ones it is common to see a temporary molar pulpless, with pericemental attachment that would be painfully resistant to the forceps, with one year or more remaining before the time for the normal appearance of its permanent successor, with the limitations of time and poverty curtailing the to-be-desired remedy, and pity forbidding extraction. Associated with this, possibly, all of this first set have ragged enamel margins surrounding cavities harboring infective bacteria. We all have seen crownless roots in the mouth even with the gum line, without abscess or notable pericemental infection, lost after years by slow decalcification of the exposed surface, atrophy and exfoliation, without a sign of pus. Observation of this has suggested the feasibility of artificially producing this condition as a measure of last resort to prevent the consequence resulting from premature extraction. One preliminary requisite for dento-alveolar abscess is the lodgment and protection which a partially enclosed carious cavity affords to pus-producing bacteria. This requisite is removed when the enclosing walls are removed. Therefore I suggest that in these cases the buccal and lingual walls be removed to the gum line, the walls of the pulp cavity bored out to diverge from the floor, the fistula irrigated with germicides, and the exposed tooth surface treated with silver nitrate. Any portion of the walls that does not interfere with cleanliness and promise to be useful may be allowed to remain. By this simple and quick mechanical measure the formation of pus is stopped, space is conserved for the permanent teeth, and the operation is painless.—Dr. P. B. McCullough, Philadelphia, Pa. (*Dentist's Record*).

DENTAL OFFICE TO LET, TORONTO.

In the Capon Building, 26 College St., fine office, hardwood floors throughout, well decorated, compressed air, rent reasonable. Apply to J. A. Bothwell, 26 College St., N. 4706.

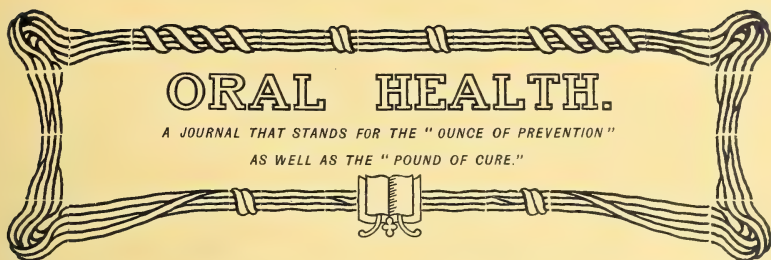
A FOOL'S PARADISE.

“A world in which there were no labors
to be accomplished, no burdens to be
borne, no storms to be endured,
would be a world without true
joy, honest pleasure, or
noble aspiration. It
would be a fool's
paradise.”



CHAS. J. C. O. HASTINGS, M.D., C.M., L.R.C.S.J.,
Medical Officer of Health, City of Toronto.

Toronto's Municipal Dental Infirmary will be organized at once by Dr. Hastings. The City Council has voted the necessary funds for the maintenance of the Infirmary, and has placed its management and supervision under the Civic Department of Health, which is presided over by Dr. Hastings.



Vol. 2

TORONTO, JUNE, 1912.

No. 6.

THE ORAL HYGIENE MOVEMENT IN CHICAGO.

BY F. F. MOLT, D.D.S.

Supervising Dentist, Department of Health, Chicago.

IN 1901 the Odontographic Society of Chicago requested of the Board of Education permission to carry out an examination of the teeth of Chicago school children. The request was refused. In October, 1910, the Odontological Society, composed of about twelve of the older practitioners of the city, again asked for the opportunity to make examinations and also to institute a dispensary in any school to be selected by the Board of Education. Their request met with gracious acquiescence and the school designated was the 93rd Street School, vacated for the newly erected Bowen High School, and to be used as an elementary school with special attention paid to sub-normal deaf and oral departments.

The work so well begun was indorsed by the Chicago Dental Society and a Public Service Commission of the larger and smaller societies appointed to carry on the movement. The examination of six hundred (600) children in the South Chicago district at this time showed ninety-seven (97%) per cent. defective.

In April, 1911, through the efforts of Dr. W. A. Evans, then Commissioner of Health, an appropriation was secured from the City Council for a supervising dentist; and, with this step made, the scope of the work in Chicago was broadened and an increased number of volunteers added to the inspection force.

In September, 1911, it was planned to institute two additional dispensaries, one at the Mark Sheridan School, north of "the yards," and the other at the Montefiore School, on the north-west side. Delays in the Board of Education deferred their opening to February, since when they have been giving most excellent service.

Efforts to induce the City Council to finance additional dispensaries and provide nominal salaries for the volunteer workers failed for this year. However, there has been no hesitation on the part of the Public Service Commission to accept donations from philanthropically inclined laymen, and, although no salaries have been paid, money for the maintenance has been provided.

It is realized that the dentists who have been instrumental in advancing the work to the present status are beginning to feel the burden of their sacrifice. The number has been small in comparison to the number of practitioners in Chicago, but they have been almost without exception faithful to their pledges, and have given one-twelfth of their working hours—one-half a day a week—to this humanitarian undertaking.

There are approximately two hundred and sixty (260) elementary schools and seventy-five (75) parochial schools in Chicago. It is estimated that in order adequately to cover the ground fifty (50) dental inspectors would be needed, and if the machinery for remedying defects found were to be equally effective fifty (50) school dispensaries would be needed. Compared with this our showing of three (3) school dispensaries and three (3) provided for by charitable organizations are a drop in the bucket. The school dispensaries are overwhelmed with requests for attention by urgent cases, making the carrying out of routine treatments rather difficult.

We have now, thanks to the generosity of one of Chicago's leading business men noted for his philanthropy, provision for establishing additional school dispensaries to bring the number up to ten, and for paying salaried dentists who will devote their entire time to this work. We are glad, indeed, to have this timely assistance, for, although we realize that this work is rightly a municipal activity, yet we recognize that it must take the course of all such altruistic movements which have had to be carried as charities until public opinion has been so moulded that the city has assumed the responsibility. The dental *inspection* being a branch of the medical inspection it will, without doubt, be provided for before the dispensaries, and we are ready to devote our energies to accomplish that end.

The third unit of the work, which is, without doubt, the most important—the matter of instruction on the subject of oral hygiene—has not been worked out as thoroughly as could be wished. Lectures have been given in several schools, and instruction in classrooms, but not systematically, because no one has been found who has been willing to assume the responsibility for this work. A complete and effective set of lantern slides has been arranged, however, and the present outlook is that this will receive the full amount of

attention due it. Tooth paste and brushes are also to be dispensed in the schools at cost.

The technique of inspection work is as follows: Blanks (figure 1) are bound in triplicate, white, yellow, and blue, the blue slip being designed to be taken home by the child examined, and bearing on its reverse side instructions regarding the necessity of giving attention to defective teeth.



A CHICAGO DISPENSARY

When examining, the inspector is seated, with back to window, and the children, coming to him in the order in which their names are found on the pad, stand in front of him, with faces toward the light.

Inspection is made with mirror and explorer, without the fingers being inserted into the mouth at all. A supply of five or six mirrors and explorers is kept in use, so that the one used may be carefully cleansed before it is again needed. This is done by scrubbing in hot,

seapy water, sterilizing in alcohol, and allowing to rinse in hot water until used.

One of the slips is filed at the school with the physical record card made by the medical inspector, and the third slip is filed at the Health Department.

Experience has shown that only a small percentage of parents heed the warning given by the notice taken home by the child; so it is intended that these records shall be followed up by the school nurses and some result obtained, either a visit to the family dentist or a request for services in the school clinics. (Figure 2 gives report made by inspector.)

It is our aim, as nearly as possible, to enforce the ruling of the United Charities, which makes only those cases dispensary cases where the family income is less than two (\$2) dollars per week per member of the family. It is, however, rather difficult to obtain sufficient information definitely to establish this status with the limited facilities for investigation at our disposal. Plans are on foot looking toward the investigation of all applicants at medical dispensaries by charities' investigators, and it is quite likely that eventually all our cases may be under their supervision. This would eliminate a prolific cause for criticism.

In mapping out dispensary work it was thought best to outline a routine course of treatment for the various cases which come under our case, and, since Dr. Buckley's formulas apparently simplified and standardized this work, these were adopted. Dispensary report cards and face and reverse of record cards are given in figures 3, 4, and 5.

The Ninety-third Street dispensary, Ninety-third Street and Houston Avenue, has to date completed operations as follows: Fillings, 254; porcelain crowns, 4; treatments, 612; extractions, 810.

The Mark Sheridan School dispensary, Twenty-seventh and Wallace Streets, has to date completed operations classified as follows: Fillings, 124; treatments, 228; extractions, 141.

The Montefiore School dispensary, Grand Avenue and Sangamon Street, has to date completed operations classified as follows: Fillings, 53; porcelain crowns, 4; treatments, 152; extractions, 147.

It is the practice in our Chicago work where unsavable roots of first permanent molars are found between the ages of 6 and 11, to extract immediately, so that the second molar, in erupting, may in a great measure usurp the first molar's position. The extraction of permanent roots is done under nitrous oxide at extracting clinics in the dispensaries, taking place at regular intervals, under the guidance of an extracting specialist.

REVERSE OF FIGURE 1.

We are now inaugurating at two schools experimental classes of normal and sub-normal children, with controls of equal number. It is planned to make the series of tests—physical, antropometric, mental, and psychological—so complete that there will be little chance for criticism, be the results what they may.

Some time previous to the establishment of the Ninety-third Street School dispensary the Englewood Dental Society, now a branch of the Chicago Dental Society, had manned a dental dispensary for the Stock Yards branch of the United Charities in one room of the Stock Yards Municipal Tuberculosis Dispensary. At present it is planned to install a salaried dentist in this clinic, but up to the present time the Englewood Society has faithfully carried out its pledge, and the dispensary has been open Tuesday and Thursday afternoons of each week. Most of the patients have been children of school age, and up to this time 2,356 operations have been performed. Mr. J. J. O'Connor, in charge of this branch of the charities, has very effectively supervised and aided the work, and has become an authority on the subject of free dispensaries.

DEPARTMENT OF HEALTH, CITY OF CHICAGO

DENTAL DISPENSARY CHILD RECORD

Name _____ Address _____

Sex _____ Age _____ School _____ Grade _____

Birthplace _____

Nationality of Father _____ Mother _____

Number of Children in Family _____

Remarks _____

FIGURE 4.

AN—Analgesic	FC—Formacresol	OZ—Oxyphosphate of Zinc
AS—Arsenical App.	SA—Sulphuric Acid	OC—Copper
DH—Dehydrating App.	RF—Root Filling	GP—Gutta Percha
COC—Cocaine Extirpation	CL—Cleaning	DX—Deciduous Extraction
PC—Pulp Capped	CR—Crown	PX—Permanent
PR—Pulp Removed	AM—Amalgam	

FIGURE 3

The Jewish Aid Society has since 1910 conducted a free dental dispensary, with a paid dentist in charge, where children of the Ghetto district are treated. Work is also done here for adults.

The Elizabeth McCormick Fund, which conducts in Chicago four roof schools and seven open-air rooms for incipient tubercular children, has instituted a dispensary in the Gault Court Bath, a municipal institution, on the roof of which School No. 3 is held. This clinic, supplied with operators by practitioners of this neighborhood not already in the school service, has cared for 24 of these tubercular children and 26 other children, performing 438 operations.

During the Child Welfare Exhibit and the International Municipal Exposition a model school clinic was displayed, in which explainers were always present to advance the propaganda. At the Child Welfare Exhibit the screens were very effective, and a creditable amount of information was disseminated.

Since then these screens, with others selected, have been displayed, under the title of "City Welfare Exhibit," at various schools, small parks, playgrounds, and social centres in the city, and it has been our endeavor, wherever possible, to have present an explainer.

If Chicago has seemed to progress more slowly than some other cities, it is because we have tried to be sure of every step before another was taken. It has been our endeavor to hold every inch of ground gained, and not to endanger the ultimate success of our work by letting the enthusiasm of the moment carry us into assuming burdens which might prove too irksome, for we have felt that slow progress was to be preferred to retrogression.

The Department of Health and the Board of Education are intimately aware of the infinite good that has been done even in the limited field to which our lack of funds has confined us. It has been the invariable history of all such movements that years have been consumed in moulding public opinion. The rank and file of the public school teachers and principals are eager in their support of the movement, well knowing that many of their problems will be aided in solution by the benefits to be derived by the children from the repairing of the ravages of caries and the giving of instruction in oral hygiene.

Before long it will be possible for us to go before the Finance Committee and present definite proof of the statement we have often made—that it is essentially a civic economy to father this work. We will be able to show that the elimination of this prolific source of retardation will lessen the expense of education, will add to the value of the school work for the children in their increased efficiency, and, more than that, will add infinitely to the community's wealth in the bettered physical condition of these "citizens in the making."

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

ANNUAL MEETING.

THE annual meeting of the Board of Directors of the Royal College of Dental Surgeons was held in the college building, Toronto, from April 29th to May 2nd, 1912.

The following members of the Board were present: Dr. W. J. Bruce, President, and Drs. Robertson, Bonnycastle, Willmott, Secombe, Donald Clark, A. M. Clark, and Abbott. The minutes of the meeting were ordered to be published, as in the past, and a copy sent to each licentiate in the Province of Ontario.

A great deal of the Board's time was spent in dealing with matters that affected the teaching and administration of the School of Dentistry. Attention was also given to the question of the legality of certain acts of the Board during the past few years. These questions were referred to the Board's solicitor for an opinion, and this, along with the correspondence in the matter, is to be incorporated in the published minutes of the Board.

Among the questions dealt with by the Board which are of general interest to the profession are the following matters:

DOMINION DENTAL COUNCIL.

Moved and second:

That, Whereas the D. D. C. accepts for matriculation any certificate which will be recognized for matriculation by the General Medical Council of G. B.;

And whereas the minimum requirement of the General Medical Council is only four major subjects;

And whereas the D. D. C. accepts for matriculation, matriculation in Dalhousie University;

And whereas Dalhousie only requires for matriculation five major subjects;

And whereas the second class teacher's certificate, with Latin, of all the provinces, requires five major subjects, as well as minor subjects;

Therefore Resolved, That the representatives of the R. C. D. S. on the D. D. C. be instructed to urgently urge the D. D. C. to accept for matriculation the second class teacher's certificate, or the equivalent certificate, under other names, of all the provinces of Canada, when these certificates include Latin.

That, Whereas the certificates of matriculation in Toronto, Queen's, McMaster, and Western Universities have been for several years practically equivalent to each other, and covering identically the same six major subjects; and, Whereas these certificates are now absolutely uniform in value;

Therefore Resolved, That the representative of the R. C. D. S. be instructed to urge on the D. D. C. that the certificates held by students of dentistry of matriculation in Queen's, McMaster, and Western, and certificates of matriculation which may be held in these universities be accepted by the D. D. C. as equivalent to its standard for matriculation and accepted for that purpose.

That, Whereas a number of licentiates in the Province of Ontario have obtained certificates of qualification in Classes C or D, and have left the province in arrears of their annual fee therefor;

Resolved, That the representative of the R. C. D. S. be instructed to secure such modification of the D. C. regulation as shall prevent a D. D. C. certificate being issued until the applicant presents a certificate from the Treasurer of the Provincial Board that he is not in arrears of any fee payable by him.

STUDENTS' INDENTURES.

Moved and seconded that, Having regard to the entirely altered conditions which now obtain from those which existed when the indenture system was instituted in the study of dentistry;

And having regard, also, to the fact that students are now required to attend four sessions of the School of Dentistry, of seven months each, and that they are systematically taught in laboratories well equipped with all the needful appliances, by teachers skilled in teaching the technical work of the profession;

And, after fullest debate and consideration, it be

Resolved, That on and after the first day of October, 1912, students' compulsory indentures be abolished, and that the summer session of the school be discontinued, and that a by-law to amend the by-laws to make them conform to this resolution be introduced. Carried unanimously.

DISCIPLINE COMMITTEE.

During the meeting of the Board the Discipline Committee held a session for the purpose of investigating complaints which had been made against certain licentiates that they had allowed non-licentiate assistants in their offices to practice dentistry. These matters were inquired into under oath, the report of the proceedings being taken verbatim by a court stenographer. A number of other questions were also discussed by the committee in relation to certain unethical

practises and a report made to the Board, which then formulated its policy in relation to these matters.

It was subsequently moved and seconded that a circular letter be prepared by the Secretary and sent to licentiates fo the Royal College of Dental Surgeons residing in the Province of Ontario, outlining the work of the Discipline Committee, and presenting, for the information of the profession, the policy of the Board in relation to unethical practice. Carried.

LICENTIATES' ANNUAL FEE.

Moved and seconded, that in view of the fact that it is clearly shown that the necessary expense of the Board is not met by the legitimate income of the Board, and that a considerable portion is paid from the tuition fees of the students, and of the further fact that the dental law of Ontario, as enforced by the Board, is securing to the licentiates the protection from unqualified practitioners, which was contemplated by the law, and in view of the further fact that the annual fee in Ontario is lower than in any other province; therefore,

Resolved, That the annual fee paid by licentiates be raised to two dollars, and that a by-law to amend By-law No. 26 to conform to this resolution be introduced. Carried unanimously.

SCHOOL CALENDAR, 1912-13.

1912.

Sept. 26.—Written Supplemental Examinations commence at 9 a.m.

Sept. 30.—Registration of Students commences at 11 a.m.

Oct. 1.—Work of the Session commences.

Oct. 5.—Register for Session closed.

Thanks giving Day.

Dec. 20.—Term Examination in each year.

Dec. 20.—Christmas Recess, commences at 5 p.m.

1913.

Jan. 7.—Classes resume at 8.30 a.m.

Jan. 7.—Term Examination in each year.

April 12.—Lectures Close.

April 21.—Annual Examination Commences.

April 28.—Board Meets at 2 p.m.

May 2.—Commencement Exercises.

DENTAL CONVOCATIONS.

DALHOUSIE UNIVERSITY.

THE Convocation of Dalhousie University was held in the Academy of Music April 25th, 1912. The following students of the Maritime Dental College have received the degree of Doctor of Dental Surgery:

Allen Boyd Crowe, Annapolis, Nova Scotia; Alden West Faulkner, Selmah, Nova Scotia; Harry Stanislaus Tolson, Bedford, Nova Scotia.

FRANK WOODBURY,

Dean, Faculty of Dentistry.

Halifax, April 26th, 1912.

UNIVERSITY OF TORONTO AND ROYAL COLLEGE OF DENTAL SURGEONS.

Special Convocation May 3rd, 1912, in Convocation Hall, Toronto. The following students received the degree of D.D.S. and obtained a license to practise dentistry in the Province of Ontario:

John Thomas Adams, Herbert Stanley Allen, Percy Gordon Atkinson, Cornell Oswald Bond, John Menzies Campbell, Thomas Cowling, Frederick Roy Davis, Robert Seneca Decker, Clement Jason Devine, Bruce Albert Dickson, Norman Kenneth Douglas, Robert Vernoy Hall, Francis Hinds, John Herbert Hockin, Arthur Robert Hynes, Frederick Henry Jones, Roy Douglas Kerr, Frederick William Landymore, George Austin Liseumb, Walter Gordon Manning, Harold Wilkinson Mitchell, John Howard Whitfield Moore, Warren Morley, Victor Harold Macaulay, Stanley Graham Macaughy, Ernest Carlyle McDonald, Roy Gregor MacGregor, Donald Keough McIntosh, Morton Aylesworth McIntyre, Robert John Pennal, Thomas Harold Renton, Ren Sheek Robertson, Frank Ernest Sanderecock, Louis Ernest Victor Tanner, Archibald Spurgeon Thomson, Robert Dunsmore Thornton, Marshall George Vair, Daniel James Weadick.

THE PROBLEM OF ADJUSTMENT.

*An Address to the Graduating Class of the Royal College of
Dental Surgeons, Convocation Hall, Toronto, Canada,
Friday evening, May 3, 1912, by
G. A. Warburton, M.A.*

In one of his papers in the *Spectator*, Addison refers to the mixture of grave and gay subjects in his various essays, and says:

“Were I always grave, one half of my readers would fall off from me; were I always merry, I should lose the other. I make it, therefore, my endeavor to find out entertainments of both kinds, and by that means perhaps consult the good of both, more than I should do did I always write to the particular taste of either. As they neither of them know what I proceed upon, the sprightly reader, who takes up my paper in order to be diverted, very often finds himself engaged unawares in a serious and profitable course of thinking; as, on the contrary, the thoughtful man, who perhaps may hope to find something solid, and full of deep reflection, is very often insensibly betrayed into a fit of mirth. In a word, the reader sits down to my entertainment without knowing his bill of fare, and has, therefore, at least the pleasure of hoping there may be a dish to his palate.”

In this one respect the present speaker resembles the great essayist, for no one has any means of knowing what direction his remarks may take—“perhaps it may turn out a song; perhaps turn out a sermon.”

The time of graduation furnishes a seasonable opportunity for considering the question of the adjustment of oneself to the new spheres of life that are just opening. At the beginning of a college career a young man finds himself thrust suddenly into a new environment. He begins to think and act for himself in a new way. He forms new acquaintances, discovers gradually the reach, as well as the limitations, of his own powers, and during his university career he is occupied with the mastery of a method of study by the use of which he adds to his store of knowledge, until in the judgment of competent authorities he is fitted to be sent forth into the world as a graduate. He finds then that he is face to face with the necessity of a new adjustment; perhaps he realizes this necessity as he

never has before. In his earlier years others thought and planned for him and helped him to fit his environment; but now the problem of adjustment becomes his own—he must face it, he must master it, or its solution will never be made.

But, while it is true that there are certain focal points by which the necessity for adjustment becomes more insistent and imperative, yet life is really one long study in the art of adaptation. Every man is continually meeting the necessity of moulding himself to his environment. If to live is, as Drummond has pointed out, to be in correspondence with one's environment, then whoever has the most fully succeeded in adjusting himself to the varying forms of life within, around, and above him, is living the most abundant life. It is because of this profound truth that I wish to speak to you to-day upon "The Problem of Adjustment."

You gentlemen who are graduating are going out to take up the real work of life. There are tasks awaiting you for which your professional training has fitted you. You will serve mankind by the practice of your profession. Society will reward you if you serve it well, but professional success depends upon self-mastery. Life is full of struggles. The hilltops, where the great vistas open, can only be reached by climbing. The ladder of Saint Augustine may be set before each of you for,

"Of our vices we may frame
A ladder, if we will but tread
Beneath our feet each deed of shame."

If the battle drags a bit it may help you to remember this little parable in rhyme:

Said Strength to Struggle, "I one would be
With you, my friend, to eternity;
Be this the bond 'twixt me and thee:
Whoever would live with pulses full
And drink to its depths the cup of joy,
Shall know thee first, or I never will
Be known of him, be he man or boy."
So they swore together a solemn oath,
Who would know one, must know them both.

The first aspect of the problem of adjustment is to be seen in the regions of one's inner life. Each of us has to determine for himself what his attitude towards life shall be. There are various paths opening before us, but the inner mental attitude towards them is really the matter of primal importance. Modern psychology

has shown us how much depends upon our mental states. We are told by some that mind is all and that matter has no real existence. It is certain that Emerson was right when he declared that "a man who stands united with his thought conceives magnificently of himself. He is conscious of universal success." Professor James, of Harvard, has popularized a phrase which is descriptive of this fundamental necessity for adjustment. He speaks of a "divided self," and in doing so comes close to the inner life of every thoughtful man. We need not be particularly religious to discover the absolute accuracy of this in the struggles toward the development of an ideal character. In the current number of *The Outlook* Dr. Lyman Abbott says:

"The Greek poet did not create the Centaur. He saw that man is part man, part beast. He saw the perpetual conflict between the two, and he imaged to his contemporaries this truth of the invisible life of man by the figure of a creature with the head and breast of a man and the body and legs of a horse. The Centaur is the Greek equivalent of the seventh chapter of Romans."

The constant reaching out after that which is best, the frequent dominance of the lower nature, the battle fought continually within a man's own soul, the aspirations and outreachings of the human spirit after a purer and better moral life—these experiences are probably universal. The clearer the vision that we have of the inherent possibilities of human nature—its capacity for virtue and all high moral strength—the more urgent does the necessity become for the unification of the inner life. All the powers of the man must move harmoniously in one direction if the ideal character is to be attained. Who does not know that instead of this many men make no progress. One set of powers impel them forward toward their goal, the other dragging them back with equal strength toward the lower levels of life. Is there not need of readjustment? Must not men discover some way in which they may harness all their energies and head them in the same direction? Life to the individual should never be suppression, contraction, restraint; but life, if it is to have its best value and to expand from within in accordance with the highest laws, must move forward under some great unifying principle. We have abundant illustrations of the practical efficiency of a unified life. Men of outstanding genius in the leadership of the race have been seized of some one great idea to which all of the energies of their soul were subordinated. Columbus dreamed of a new world, and led his timorous sailors to its discovery. Savonarola set himself to impress Florence with its direct accountability to God, and the clarion notes of his message reach to our own times. Livingston looked upon a dark continent until his heart was filled with a passion to take it the light of Christian civilization, and

light streams now into the dark continent. Florence Nightingale loved the suffering soldiers in the Crimea with a devotion so pure that men in hospitals thought they had been brushed by an angel's wing when she passed by their couches.

So each of us must have his ideal—some great vision that seizes the soul, drawing it together and giving the whole life the value of unity. There can be no social harmony for any of us until the discord is gone out of our own life, and this will not come to pass until our powers are co-ordinated by one dominant and absorbing purpose. I wonder if each of you has determined what that supreme principle of conduct is to be! President Eliot, of Harvard, one of the sanest moralists as well as an educator of the highest rank, says:

“We should not live to work, but work to live—live in the home affections, in the knowledge and love of nature, in the delights of reading and contemplation, in the search for truth, and in the worship of the beautiful and good.”

We all know this to be true. Like Thoreau, many a man wishes to “push life into a corner and reduce it to its lowest terms.” Quaint old Izaak Walton, whose immortal work makes good reading for any man on a May day, tells his scholar:

“I knew a man that had health and riches, and several houses—all beautiful and ready furnished—and would often trouble himself and family to be removing from one house to another; and, being asked by a friend why he removed so often from one house to another, replied: ‘It was to find content in some one of them.’ But his friend, knowing his temper, told him if he would find content in any of his houses he must leave himself behind him; for content will never dwell but in a meek and quiet soul.”

These considerations bring us to another aspect of the question of adjustment, for not only must a man live with himself, but he must live with his neighbors, too. There is no phase of modern life that is more apparent than the inter-relation of human beings. In religion, in economics, in politics, both national and world-wide, emphasis is being placed upon the social need. Working out from the individualistic view of life which we have been considering, we come to the realm of friendship, and we must consider this intimate human relation into which every normal man will find himself growing. Sociability is an expression of feeling of the heart and the emotional life. No matter where men are found, or under what conditions they live, sociability is a necessary part of their life. In the rural districts, after hard days of toil, the young farmers find their way to one another's homes, where the social life may find expression. The inverted nail-keg at the corner grocery becomes,

each evening, the centre of a social group, where the gossip of the neighborhood is exchanged. The participants in the discussion are turned thither by an irresistible attraction. It is not that the store contains a long list of staple commodities—ranging from a cure-all liniment to cowhide boots—that men are there, nor because of the fund of information which each expects to receive or contribute, but rather owing to the instinct of fellowship, the irrepressible desire to meet comrades. Every factory and workshop has its place of social meeting during the noon hour, toward which the mechanics and laborers turn with eager anticipation; every roundhouse which shelters engines has its lounging corner or its oil room, where groups of enginemen gather for social talk. "The stove committee," in railroad parlance, means merely that group of men who, in social intercourse, express the prevailing opinions of the men, sometimes with respect to their work and sometimes regarding the policy of their employers. The saloon and club room are one of the expressions of the social life of men, and are sought, chiefly at least at first, because they meet the social requirements of their patrons. It is all very well for the philosopher to say, "Each must stand on his glass tripod if he would keep his electricity," but our conception of a man's place in the world is not adequately represented by such a figure. It does not seem to be the highest function of manhood to act as an unrelated reservoir of electrical or any other energy. Society wants to feel the thrill and glow of every man's life. As every man is a product of social forces he is also under obligation to contribute the strength of his personality to social development and progress.

There is one art that we can all practice—it is the fine art of friendship. There is no art better worthy to be called fine than this. It is one which calls for the exercise of the best qualities of the mind and heart. Painting, which is one mode of giving outward expression to beautiful ideals, employs the palate, the brush, the easel, the canvas. The sculptor takes up his hammer and his chisel and carves, by slow processes, a graceful and beautiful form out of a rough piece of marble. Whoever practices friendship is just as truly an artist as are the painter and the sculptor, for he is shaping into richer beauty the life of the one upon whom he bestows his human feeling.

There is no influence outside of the family and the home which tell so much upon the life of men as the kind of friendships which they form. These friendships are both the index and the mould of life. They show what kind of men we are. Birds of a feather perch in the same tree. All animals answer to the call of their own. Certain cities are sought by certain types of men: Monte Carlo for the gamblers; Mecca for the Mohammedans. In any town good men are trying to find those who are virtuous; cultured people those who are refined; snobish people those whose position enables

them to shine with the glamour of outward show; serious-minded folk attract by an irresistible law those whose views of life are like their own, and as inevitably repel the vain, the frivolous, the addleheaded.

Emerson tells us that "The laws of friendship are austere and eternal of one orb with the laws of nature and of morals. But we have aimed at a swift and petty benefit, to such a sudden sweetness. We snatch at the slowest fruit in the whole garden of God, which many summers and many winters must ripen." The first adjustment that must be made in the development of true friendship relates to our vision of what our friend really is. The deepest insight is not the proverbial *blindness* of love, but the penetrating discovery of richness and beauty in character. Just as no poet is so capable of giving us the lesson of Nature as Wordsworth because of his love of it, so there is surely a secret in true friendship which the stolid, unsentimental passer-by can never see. Love sees things as they are.

These are two guides into the permanent relations of friendship. Trust and faithfulness must be followed habitually or the harmony is broken, the music is spoiled. It must be a mutual relation, to be sure, but you may well believe that generosity on your part, confidence and loyalty, given with an almost reckless abandon, will surely secure an answering response. But even here it is not the response that is the prime motive in friendship, least of all are friends to be judged by their social or economic value. "Some men shed friends at every step they rise in the social scale," says Hugh Black. All right-minded persons have only contempt for such as prostitute this high art in such a fashion. It would be very easy to show that the man who practices friendship gains by it. He gains unmeasurably in the richness of his own personality; he multiplies his graces, enlarges his interests and his horizon, and in all way lives more truly than he otherwise could.

I presume that some of you may already have thought of the family relation! The springtime, with the bird songs and nest building, are more interesting than ever. The reason is that some fair maiden, pure as Una, and guileless as Evangeline, has crossed the pathway of your life. She may be here to-night, but whether she is or no, you share the poet's fancy that "when she had passed it seemed like the ceasing of exquisite music." It is well. The home will be established in due time, let us hope. The orange blossoms will fade, but the family will persist. We know that incompatibility is a common modern term. Even in Canada there are divorcees, and a recent authority declares that the moral conditions indicated by the numerous divorcees in the United States are appear-

ing in the Dominion to an alarming extent. Anything which threatens the family strikes a blow at the foundations of our modern social order. As President Eliot has said:

“The family is the main object of all the strivings and struglings of most men; the welfare of the family is the ultimate end of all industry, trade, education and government. If the family is prosperous and permanent, the State and civilization itself will be safer and safer through all generations.” Here again is a problem of adjustment. The man and the woman who would live happily must constantly adjust themselves to each other. The more highly organized the individual may be the greater the necessity for this adjustment and the more difficult it is. Instruments that are highly strung answer more quickly both to harmony and to discords. It is for this reason, I suppose, that church-goers are subject to so many disturbances! Much depends upon the choice of a wife. Similarity of tastes, ideals, religion, education, social status, all these enter into the problem at the start, and then—well, the happy home is the one where under the sway of true love each member of the family fits in by the exercise of adaptability, by the generous interpretation of the conduct of others. At first this adaptability will and must be conscious. It will involve effort, but it will grow to be habitual and involuntary, just as the finest music comes when the fingers move instinctively to the right keys, but this is only possible after years of persistent application.

There is an obligation of adjustment resting upon the citizens of such a country as Canada which should make a strong appeal to all educated young men. The nation is plastic. God is said to bury the mould of his great men. He never makes two personalities alike. It is equally true of nations. It comes out of the womb of time with a combination of elements unlike those which went into the formation of any other. Canada, though British, is not like Great Britain, not like England or Ireland or Scotland. It welcomes immigrants from these and other lands, but it wishes them to become Canadians in spirit and in life. We all sense a distinction between the national conditions here and in the United States and know full well that Canada has a large and independent destiny. The history of the British Empire is the history of the growth of the democratic idea. This idea is embodied in the British Constitution. The Throne, the Cabinet, the Parliament, all of the vast machinery of government, are for the benefit of a free people. The Empire brings the great self-governing nations into a unity which is the wonder of the civilized world. In Canada the national consciousness is a great and beneficent reality. Apart altogether from any particular policy, annexation to anything under the sun is an

impossibility, as we all well know. But just as youth with its strength is a time of danger unless that bundle of energy which we call a boy—an enigma in trousers—is well directed, so in our national life we may easily become self-centered and fail in working out our manifest destiny, unless men of education and character assume and bear the responsibilities which belong to citizenship. We must know what the problems of the Empire are. We cannot live and die to ourselves. The world as a whole is bound together. There is no north, no south, no east, no west, so far as division of interests are concerned. The world currents are stronger even than national or the imperial. They are made up of the ebb and flow of national feeling. The backward races are moving with a speed that is incredible. More has happened in China within five years than any dreamer could have imagined likely to have occurred in a century. And there is no great national or social change taking place upon the face of the earth or can take place in which we are not concerned. Within Canada the solidifying of the national sentiment so that the East and the West as well as the great Central Provinces shall be actuated by common ideals, dominated by kindred aims and filled with a passionate loyalty which is the only guarantee of national permanence.

The great economic problems which other countries are now facing—Great Britain and the social current, the United States with its progress and poverty, its vast concentrated wealth, much of it unspeakably vulgar and menacing, to say nothing of Germany, in which democracy is finding a clearer and more insistent voice—these are not present to the same extent in Canada. But Canadian cities have the problems of vice and crime. Immigration is as serious a menace to Canada as it ever was to the United States, threatening to lower the moral standards and to decrease the power of true religion by the introduction of alien ideas with the vast inflow of alien races. The ship of state may ride the waves if she strikes the danger “head” on, but if she comes upon it heedlessly in the midnight of fancied security she will founder and sink in spite of the escape of the few in the lifeboats provided by society. The problem before you, my young friends, is to see clearly what your part should be in such matters, to discover the place where you as loyal citizens may serve your generation and your nation in the best way and then adjust yourselves to this social task with courage and an unflinchable will. The will of the people is really supreme. The will of all the people—the rich, the poor, the learned and the ignorant. In Canada the best British traditions are preserved. The nation is growing in self-sufficiency. The problems confronting it require the nicest adjustment. To keep up and strengthen the British sentiment, to maintain the estab-

lished relations of loyalty to the King as the Head of the State, and to do this without infringing upon the local autonomy of Canada as a free nation within the Empire, this is the problem that is before the statesmen of this Dominion. The need of intelligent leadership in national affairs is apparent. Each of you should take your part in such great questions.

But there is still another adjustment that we must make, for not only are we living here among our fellow-men, but we are conscious of our relations to other and higher spheres of life. The greatest forces of the universe are those that lie behind phenomena. The natural order is no more a reality than the moral order. We must hold some relation to the idea of God. In the midst of a Christian civilization we cannot avoid forming some opinion upon what the relation is that *does* and *should* exist between ourselves and the Source of all life and knowledge. If the State is to be stable and the home is to remain pure; if the individual life is to be exalted to its highest and best expression, we must give religion its place in our scheme of thought and conduct. We may not all agree upon just how we shall cultivate our religious faculties, but we can hardly escape the conclusion that if life is to have its full value God must have His place in it. It would not be seemly for me to dogmatize, nor is my temper in the least dogmatic, yet you will permit me to urge you to pay attention as serious-minded men to this greatest of all questions and to remind you that Jesus Christ is to-day compelling the respect and arousing the enthusiasm of men as He never has before in the history of the race. The changes of the social order, the growth of the democratic idea, the spread of altruism in the world, even the revolutions that are shaping the history of the world, are all of them influenced by the teachings of Jesus. Some may turn to agnosticism in their revolt from a too extreme dogmatism, but because my neighbour cannot see I need not be blind.

“Shall the mole from his night underground
Call the beasts from the day glare to flee?
Shall a man blind his eyes and exclaim,
It is vain that men weary to see.”

Surely one of the great heritages of the British race is its religion, its faith in God and in the moral order. If that is lost or dimmed we shall not be able to render the world service that we should. The white man's burden can only be borne by shoulders filled with the strength of the Divine. The destiny of the world is in our keeping to a large degree. It becomes us then to adjust

ourselves to the great sources of personal, social and national power in such a way that we become the channels through which the world may be enriched and blessed.

You will see, gentlemen, that I have spoken to you in a somewhat general fashion. Others could discuss questions of professional success or treat of professional ethics. I could not take up such questions. Of this, however, I am sure: to be a man, strong, pure, patriotic, unselfish; to live in the realm of the ideal, inspired by it to high living and noble thinking, and at the same time to keep abreast of the life of one's own time; to have great visions and yet not be visionary; this is worth even more than to obtain as a result of your work an honourable degree from this University. Perhaps I cannot express my thought of what life should be for you any better than by quoting from Mrs. Browning's *Aurora Leigh*:

“For 'tis not in mere death that men die most;
And, after our first girding of the loins
In youth's fine linen and fair broidery
To run up hill and meet the rising sun,
We are apt to sit tired, patient as a fool,
While others gird us with the violent bands
Of social figments, feints, and formalisms,
Reversing our straight nature, lifting up
Our base needs, keeping down our lofty thoughts,
Head downward on the cross-sticks of the world.
Yet he can pluck us from that shameful cross.
God, set our feet low and our forehead high,
And show us how a man was made to walk!”

IMMUNITY AND SUSCEPTIBILITY OF THE TEETH TO CARIES.

BY RUSSELL W. BUNTING, D.D.Sc., ANN ARBOR, MICH.

(Read before the Third, Fourth, and Ninth District Societies (N. Y.), at Schenectady, Nov. 21, 1911; also before the Missouri State Society, at Kansas City, April 16, 1912.)

AS members of the dental profession we hear that criticism that we are accentuating the wrong side of our profession; that we are putting our greatest efforts and endeavors in the perfection of our reparative measures, and that we pay but little attention to the question of the cause of the various dental diseases. Our attention is called especially to the fact that we constantly are dealing with the ravages of caries of the teeth, yet at the same time we do not understand the factors which produce caries, nor are we able to eliminate them at will to prevent the occurrence of the disease. In other words, we have not done for this dental disease what Jenner did for smallpox, what Behring did for diphtheria, and what Wright and Haffkine have done for typhoid.

We feel, however, that such a criticism is unfair, and is made by individuals who have no conception of the intricacy of the problem, nor do they in any manner appreciate the character of investigation which has been directed toward this very question. When we look back along the long line of evolution through which our knowledge of this subject has passed, and when we consider the tireless efforts of our dental scientists, who have applied to this problem every known principle of research, we feel that, although the question is not settled, nevertheless the efforts which have been put forth in this direction have been commendable and are worthy of recognition. As long as the science of dentistry stands, the names of Miller, Williams, Black, Kirk, and others who have contributed so largely, will live and be honored for the light which these men have thrown upon the subject of the cause and control of caries of the teeth. Each year some new contribution is added to the fund of our knowledge of the subject, bringing us nearer to the true solution of the problem, if such a solution can be found.

EARLY THEORIES REGARDING DENTAL CARIES.

In the earlier periods of our profession the causative factor of tooth destruction in the process of tooth caries was not understood, many theories being held regarding it. There were those who considered caries to be a manifestation of inflammation of the tooth. This theory dates back to very early times—when Hippocrates, in 456 B.C., made the statement that toothache is the result of “the stagnation of depraved juices in the teeth.” Later adherents of this theory were such men as John Hunter (1778), Benjamin Bell (1787), Joseph Fox (1816), and Thomas Bell (1831). In more recent times the inflammation theory has been championed and staunchly supported by Heintzman, Boedecker, and Abbott, who in the eighties wrote much in the substantiation of the claim that the dentin contains circulatory spaces, and that in these inflammatory and suppurative changes occur which are synonymous with caries.

At the same time other notable men, believing that the loss of tooth substance by caries was due to an acid decalcification, maintained that the free acids of the mouth are responsible for the process. Such men as Sir John Tomes, Watt, and Jonathan Taft were strong advocates of this theory, and we have a text by E. Magitot, written in 1878, in which he describes the process of caries as being due to the free acids of the mouth.

Leber and Rottenstein, in 1867, called attention to the probable causative association of bacteria with some phases of caries. By staining carious dentin with iodine, the dilated dentinal tubuli were shown to be filled with granular bodies, which they recognized as bacteria. At that time no means for the isolation and identification of bacteria were known, and they could carry their investigations no farther. At the World's Medical Congress, 1881, Milles and Underwood reported their investigations of the subject, and stated as their belief that caries is the result of decalcification produced by acids secreted by certain bacteria.

MILLER'S WORK.

It remained for Dr. W. D. Miller, who was a firm believer in the germ theory, to demonstrate conclusively the validity of that view. Familiar as he was with the work of Dr. Koch, as soon as the process of isolating and identifying bacteria was made a certainty, Dr. Miller applied these principles to the bacteria of caries and established his hypothesis. His conclusions were that caries of the teeth is the result of decalcification of the tooth substance by lactic acid, and that this acid is the result of fermentation of carbohydrates; that this lactic acid fermentation is produced by a large number of bacteria which are common in the flora of the mouth, and that the carious process always begins on the exterior of the tooth and never in the interior.

This work of Dr. Miller is, without doubt, the most valuable contribution to the subject of caries that has ever been made. His labors were so painstaking, and his conclusions were so completely proved that, although they have often been contested, they have never been refuted to this day. They, therefore, stand as a foundation upon which all of the subsequent observations have been builded.

Granting, then, that the findings of Miller are true, and that we do understand the process by which the tooth is destroyed by caries, the dental profession is still confronted with a seemingly greater question, namely, the factors which determine that one tooth shall suffer caries while another will not, or the factors which make certain mouths immune to caries while others are strongly susceptible. It is this question of the immunity and susceptibility of the teeth to caries, with the ascertaining of methods of procedure whereby immunity may be established in the mouths that are susceptible to caries, that stands to-day as a challenge to our profession for solution.

CAUSES OF VARIATIONS IN SUSCEPTIBILITY TO CARIES.

The variations in susceptibility to caries of certain teeth or sets of teeth must depend upon two factors—first, the internal resistance of these teeth to the carious process; and, second, the strength of the external attacking force. The statement is often made that certain teeth are “soft,” and therefore suffer caries. In his researches, in 1895, on the “Physical Characters of the Human Teeth,” Dr. G. V. Black investigated the strength of a large number of teeth, and states as his conclusion that “neither the density of the teeth nor the lime salts they contain has anything to do with the liability of the teeth to suffer from caries.” Dr. Miller also attacked this problem experimentally, and found that the dentin of different teeth was decalcified by the acids of caries at differing rates, and that some enamels were more resistant than others. This difference is not great enough, however, to determine immunity. He calls attention to the fact that in the interproximal space caries frequently attacks one tooth much more vigorously than the other, or may fail to produce any effect upon one, while the other suffers extensive loss of tissue. In this connection he says: “This resistance depends to a certain extent upon the structure of the tooth, upon the perfection of its external enamel crust, the enamel cuticle, and upon its freedom from fissures, bruises, cracks, or weak lines such as are produced by uncalcified prisms.”

Rose in Germany and Forberg in Sweden have made extensive investigations as to the condition of the teeth in the children. They

both state that the children who live in localities in which the soil and water are rich in calcium salts have teeth which are well formed, are hard, and have little caries, while the inhabitants of communities in which the soil and water are poor in calcium salts have poorly formed teeth which are very prone to caries.

It may be seen, therefore, that the question of how much influence the resistance of the tooth plays in the process of caries is not definitely settled, there being a diversity of views. It is possible that certain teeth by their form, structure, and perhaps vital force, may resist the action of caries to a considerable extent. It is not probable, however, that these structural or physical characteristics of the tooth are transitory, but are largely constant until affected by some external influence. They, therefore, cannot account for the sudden changes from susceptibility to immunity, or vice versa, which we see occurring in the mouth. We must look, then, to the second class of factors—those without the tooth, which have to do with the virulence of the attacking force—and seek in them the solution of our problem.

In a consideration of the factors of caries which are external to the tooth, we distinguish three classes—first, the micro-organisms which produce the lactic acid fermentation; second, all the food in the saliva upon which these bacteria may live and produce the necessary acid; and, third, those influences which may help or hinder the growth of the bacteria.

MICRO-ORGANISMS.

It was clearly shown by Miller that no one organism was responsible for the production of caries, but that ten varieties were commonly found in the mouth, any one of which might produce lactic acid when acting on carbohydrates. He also states that, in his investigations, those who were immune to caries had the same organisms present in their mouths which were to be found in the mouths of the susceptibles. In a number of cases, however, the virulence of the fermentation was greater in the susceptible saliva, but this difference was not constant enough to be looked upon as a controlling factor.

It was first pointed out by Williams, and later corroborated by Miller, Black, Kirk, and others, that the growth of the bacteria of caries usually takes place beneath a thin plaque or film, the plaque confining and intensifying the action of the acids formed. Although its presence has been well demonstrated, still by reason of its thinness and transparency the plaque has resisted the efforts put forth in the endeavor to determine its composition and the method of its formation. It has been spoken of as "gelatinous," "glutin-

like," "zooglea," etc., by various observers, but has been generally considered to be the product of the bacteria of caries, thrown up for their protection. Another theory has been advanced lately by Kirk, in which he claims that the plaques are formed of mucin, and that this mucin is precipitated from the saliva by the lactic acid produced by the bacteria.

The office of the plaque seems to be that of protection of the bacteria from dislodgement and the confining of its products against the surface of the tooth. Were it not for some such agent the bacteria would soon be washed away, or the acids which they produced would be diluted by the saliva, so that they would have little or no effect upon the tooth. As stated by Black, 98 per cent. of all caries occurs upon three definite locations on the teeth, namely—(1) pits or fissures of the occlusal surfaces; (2) approximal surfaces; and (3) the gingival third of labial or buccal surfaces. This fact is probably due to the limiting action of the plaque.

Bacterial plaques may be located by painting the teeth with a solution of potassium iodid. It will be noticed in the average mouth that plaques are present upon surfaces of the teeth which never decay, and that the mouth of an immune will often have as many plaques as that of the susceptible individual. From this we might infer that lactic acid fermentation does not always occur beneath a plaque. In fact, it is possible that putrefactive rather than fermentative changes may take place, in which case the tooth would be protected from caries.

FOODS FOR BACTERIAL GROWTH.

The foods upon which the bacteria live and form their products are derived from three sources—the saliva, the foods taken into the mouth from without, and the substance of the tooth itself. As shown by Miller, lactic acid fermentation is dependent upon carbohydrate as a food, so that it is the carbohydrate element of the saliva, foods, and tooth substance to which we must give our attention.

Carbohydrates.—The carbohydrates in the saliva, outside of those which are ingested, are very limited. The only possibilities which we can see lie in the mucin and glycogen, each of which have been the subject of much discussion.

Mucin.—This is a gluco-protein containing nitrogen. It is secreted by the parotid, submaxillary, and buccal glands, and is found in varying quantities in the mixed saliva. The reaction of mucin is slightly acid, and, as has been brought out by Kirk, the

mucin secreted by the buccal glands may contain acid phosphates of sodium and calcium, which will produce erosions and caries at the necks of the teeth. Mucin, because of its carbohydrate radical, may undergo lactic acid fermentation, and in many cases probably furnishes food material for a considerable acid production. It is possible, then, as stated by Kirk, that these same acids may precipitate other fresh mucin to form a protective and nutrient plaque over the lactic acid organism, binding it to the tooth. Such a process as this may have the power to produce caries. That this does not always occur is seen in the fact that many mouths have a superabundance of mucin, but the teeth are immune to caries. There is, nevertheless, no doubt that the mucin of the saliva is a considerable factor in the process of caries, in that by its presence it interferes with the prophylaxis of the mouth, favoring the retention of foodstuffs about the teeth, and may itself furnish food material for lactic acid fermentation.

Glycogen.—This is a carbohydrate formed in the liver from ingested carbohydrates, and from proteins containing carbohydrate radicals. In a paper entitled "Sialo-semeiology," in 1900, Michaels asserted that glycogen is frequently found in the saliva of young people, and that, acting as a food for bacterial fermentation, it has a direct relation to caries. Hammarsten states that glycogen may appear in the saliva in certain pathological conditions and is usually derived from diseased bronchial passages. The causative factor of glycogen in the process of caries is combated by Miller, who conducted a number of experiments investigating the action of fermentation on glycogen. His conclusions were that glycogen does not occur in the saliva in a sufficient quantity to undergo a lactic acid fermentation. He closes his remarks upon this subject with these words: "The results of all my investigations seem to fully justify the conclusion that no fermentable substance of the group of carbohydrates occurs in the saliva in sufficient amount to materially influence the progress of caries."

From this we see that our knowledge of the food elements of the pure saliva which are capable of lactic acid fermentation is very vague, and that the matter is still debatable. There is need for further investigation of these two elements, mucin and glycogen, that their relation to caries may be established or disproved.

Ingested Foods.—There is little doubt that the process of caries is affected by the quantity and character of the food ingested. Of our mixed diets of protein, carbohydrates, and fats, it was clearly shown by Miller that the carbohydrates, starches, and sugars were the only foods which were capable of lactic acid fermentation. The starches must first be reduced to sugars by the action of the ptyalin

of the saliva, and then the combined sugars form an admirable breeding-place for lactic-acid-producing bacteria. Without these carbohydrates caries could not occur. This recalls the classic illustration of the principle, namely, that the Eskimos, who live entirely upon meat, fat, and oil have almost no caries. We are all familiar with the other extreme as seen in the case of millers and candy-makers, in whose mouths carbohydrates are always present and the ravages of dental caries are extreme.

Kirk lays special emphasis upon the character of food substances present in the mouth. He attributes the prevalence of caries in children to the excess of carbohydrates in their food, the carbohydrates being found in biscuits, candy, and many soft foods which they commonly eat. In this connection he says: "I regard the absence of insufficiency of carbohydrate material in the salivary composition as one of the important, if not the most important, factors in immunity to dental caries."

The amount of carbohydrates which remain in the mouth to be food for the bacterial growth stands in a direct relation to the oral hygiene. In some cases large amounts of carbohydrates are ingested, but only a little remains in the mouth, while in other cases the process is reversed. This subject will be taken up a little later.

Foods in Tooth Substance.—It is not probable that there is any appreciable amount of food in the enamel which the organisms of caries can use. So that, for the invasion of the enamel, the bacteria must depend upon the materials brought them by the saliva. When the carious process reaches the dentin, it finds a certain amount of nutritive material which enables the infection to travel deep into the interior of the tooth. This has been shown by experiments upon living animals in which cavities were drilled in sound teeth, infected with caries organisms, and the orifices hermetically sealed. In this manner all the carbohydrates of the mixed saliva were excluded. A later investigation showed that extensive caries had taken place, the organisms having thrived and produced their acid.

INFLUENCES WHICH HELP OR HINDER THE GROWTH OF THE BACTERIA OF CARIES.

For the proper growth of the carious process certain conditions are necessary, namely, *lactic acid bacteria must be present, the bacteria must be protected from dislodgement, proper food must be provided, and the acids which they produce must be confined against the surface of the tooth.* Any influence which will affect this chain of factors will either help or hinder the process of caries. In the consideration of this phase of the problem we are con-

fronted by a seemingly endless number of factors which may have a bearing upon the growth and life-history of the organism of caries. A very large class of important influences may be considered under the head of "oral hygiene."

Oral Hygiene.—This is the science of health and its preservation in the oral cavity, with special reference to caries of the teeth. Perhaps the most potent factor in dental diseases is uncleanness of the oral cavity, so that the term "oral hygiene" has become synonymous with oral cleanliness. Absolute cleanliness of the mouth would mean that all foodstuffs and foreign matter be removed, and that the oral cavity be made sterile. In such a condition the teeth would be bathed in a sterile solution of mixed salivary secretion, and obviously no caries would occur. Absolute cleanliness of the mouth cannot be accomplished, and an approximation thereto can only be maintained a short time. The mouth cannot be kept sterile, nor can we remove all traces of foodstuffs from the saliva and the teeth. The matter of mouth cleanliness is, therefore relative, and in so far as we depart from the condition of perfect cleanliness do we introduce the factors which militate against the health and welfare of the tissues of the mouth.

Many mouths are said to be "self-cleansing." That is, relatively little food material remains about the teeth at the completion of a meal. Such a condition is dependent upon a thorough mastication of the food ingested and the character and quantity of the saliva.

Cleanliness by Mastication.—By thorough mastication we mean the division of the food into minute particles and the trituration of it with the saliva. This process not only reduces the food to a consistence in which it will be most readily acted upon by the digestive juices, but also serves as a most potent cleansing agent for the teeth. Let an individual live upon soft foods entirely, never using his teeth to masticate hard substances, and they will soon become coated with food and mucoid deposits, in spite of all that he can do with brush and dentifrices.

Thorough mastication and the subsequent self-cleansing can only be accomplished in a mouth in which the anatomical structure and arrangement is of good character. The occlusion of the teeth must be near the normal. The teeth themselves must be well formed, with hard, smooth enamel, and free from deep pits and fissures. The approximal surfaces must be well contoured to form clean, definite "point contacts," rather than the flat "surface contact" which tends to retain the food in the interproximal space. High and definite marginal ridges are needed on the molars and bicuspeds to divide the food and to protect the interproximal

space from an excess of food material. In such a mouth all the surfaces of the teeth which are vulnerable to caries are rubbed continually during mastication by the excursions of the food across them. In this manner plaques which may have been formed will be rubbed off, and decalcification by caries will be averted.

We are all familiar with such a condition as has just been described, and know that it is typical of many cases of immunity to caries. We also know the mouth with irregular teeth which have few occluding surfaces, teeth with cavities, teeth with flat approximal fillings which have no proper contour, point contact, or marginal ridge. In such cases we usually find quantities of food material constantly about the teeth and the ravages of caries very evident. It is a very significant fact that when such a case as the last mentioned is treated according to the best methods of modern dentistry, when every tooth is given a proper contour, when point contacts and marginal ridges are rebuilt, the patient frequently ceases to suffer from caries and enters the class of immunes.

The work of Dr. Black in his propaganda of "extension for prevention," and the work of D. D. Smith and his followers in that of prophylaxis, have shown us conclusively that proper tooth contour and strict prophylaxis will prevent caries in a large number of individuals, and furnish us with a great factor which must be recognized in the establishment of immunity.

But, great as the factor of cleanliness is, we cannot overlook the fact that caries is seen frequently in mouths in which the strictest prophylaxis is maintained, while the converse is equally true, namely, that many filthy mouths are perfectly immune to caries. Cleanliness is, therefore, a factor in the determination of the conditions of immunity and susceptibility, and in some cases is the controlling factor, while in many other instances it is but one of several influences which, by their combined effects, produce a condition which is favorable or unfavorable to caries.

The question, then, naturally arises, What influences other than those which have been mentioned are there that are capable of determining the action of bacteria with respect to localized lactic acid formation? In the quest for this other substance every component of the saliva has been investigated, and the estimations have been made as to their possible effects. Of the salivary constituents the one which has received the most attention especially in late years has been the potassium sulfoeyanate. Extensive investigation has been directed toward this principle, and the work is still being carried on.

POTASSIUM SULFOCYANATE IN THE SALIVA.

This salt occurs in the saliva in exceedingly small quantities.

Data from various observers state percentages ranging from 0.00016 to 0.041 as being found in normal salivas. Little is known as to the source or physiological function of KCNS, and until recent times little importance has been attached to it. Michaels called attention to the relation of the chemical and physical conditions of the saliva to the various disorders of the general metabolism. He makes the statement that the alkaline sulfocyanids prevent putrefaction, and therefore arrest caries. This phase of the problem has been taken up by Dr. Low, Dr. Waugh, and many others, who claim that their results show an absence of KCNS in the salivas of susceptibles, and that the salt is usually present in the mouth of immunes. They felt that the KCNS had a restraining action upon fermentation or upon the ability of the bacteria to form plaques.

In opposition to this view a number of observations have been reported to the contrary. Tests made in the University of Michigan laboratory among the students did not show KCNS in a large percentage of immunes, while an equally large percentage of susceptibles gave a good test for cyanates. It was also shown that the test for KCNS that was commonly used was not specific, and results might appear positive when no KCNS was present. In a very extensive work done under the auspices of the New York State Dental Society, Dr. Gies, of Columbia University, reports that his results do not show any relation between KCNS and immunity. The efficacy of KCNS in its power to control caries is still unproved.

Three other constituents of saliva should be mentioned as having received special attention regarding their relation to caries, namely, ptyalin, the general acidity of the mouth, and the alexins.

PTYALIN IN THE SALIVA.

Ptyalin is an amylolytic ferment which is found in all salivas. It has a direct influence upon caries, in that it reduces starch compounds to a form in which they may undergo lactic acid fermentation. It was asserted by Hinkins that ptyalin not only reduces the starches to sugars, but also forms lactic acid, and in this manner produces caries without the aid of the bacteria. In refutation of this theory, Miller published the results of his experiments, in the issue of the Dental Cosmos for November, 1905, and made the statement that ptyalin acting upon carbohydrates never forms acid in sterile solutions.

GENERAL ACIDITY OF THE MOUTH.

The free acids of the mouth, such as fruit acids, acids of vomitus during pregnancy, and acids formed by fermentation of the

saliva, have been held by some as a causative factor in dental caries. It is very evident that, if the total acids of the saliva were able to produce caries of the teeth in and of themselves, the cavities would not be localized, but would extend over the whole surface of the tooth. The total acidity of the saliva, therefore, can promote caries only in so far as it may help or hinder the growth of the lactic acid organism. In the investigation of this point it was found that the growth of the organisms producing lactic acid was more rapid in alkaline than in acid media. It is true that in acid media there is some acid present at the beginning of the fermentation which will augment the acid formed, but the growth of the organisms is so much more rapid than compensates for the difference in a very short time. Hence we see that the free acids of the mouth do not accelerate the progress of the caries. It is possible that in certain cases the acids may roughen the surface of the enamel, affording a surface which is more favorable for the attachment of the plaques, and thus inducing the inauguration of caries. After the plaque has formed, and the caries begun, it is thought that the reaction of the media has no effect upon the process.

ALEXINS IN THE SALIVA.

It has been suggested that there may be in the saliva certain anti-bodies which are similar to those found in the blood, and that these anti-bodies are capable of controlling the growth and activity of the lactic acid bacteria. Many manifestations of caries lead us to suspect that some such agent may be present in the saliva, exerting a control over the process. Little work has been done in investigation of this possibility. Miller has stated as his belief that no anti-bodies exist in the saliva which are capable of controlling the bacterial growth, but says that the subject should receive more investigation.

CONCLUSIONS.

From the foregoing we see that our knowledge of the subject of immunity and susceptibility of the teeth to caries is made up of a heterogeneous collection of facts, pseudo-facts, and theories, so that we can agree with Dr. Kirk, who says that the whole process is still a sealed book.

The manifestations of susceptibility of the teeth in our patients to caries are familiar to all of us. We find that caries of the young runs riot, and that when the age of maturity is reached the teeth are no longer attacked by caries with the same severity. Then, in middle-aged individuals who have had no caries for many years a number of cavities suddenly appear in their teeth. This change in susceptibility may or may not be accompanied by a change in the general health of the individual. These changes from immunity to

susceptibility and vice versa are in their nature so obscure that they remind us of nothing so much as that general property of the body which determines its resistance against infections. The existence of such a substance in the saliva, with its nature and its source, is yet to be demonstrated.

Much as we are inclined to look for this intangible something which we can point out as the predominating factor, we cannot but admit it to be more probable that the process of caries does not depend upon any one factor, but is a result of several factors acting in the same or in opposing directions. Some of these forces have been pointed out in this paper, and attention has been called to their relation to the process of caries. It has been seen that caries is directly dependent upon the amount of infection present in the mouth, upon the carbohydrate food element habitually remaining about the teeth, and also upon the masticatory efficiency of the mouth and teeth. Added to these may be the influence of the structure of the teeth, and the reaction and composition of the saliva. These forces work together to produce or to hinder the progress of caries. We are not at all certain that this is a complete list, for it is very possible there may be some other substance or substances which are more potent in the determination of the growth of the carious process than any of those mentioned.

We do know, however, that by proper mouth prophylaxis, by the best modern reparative measures, and by the regulation of the diet, we may restrict the action of caries in the average individual. Thus, by mechanical measures, we produce a partial or complete immunity, in spite of unfavorable conditions which may be existing in the mouth. Until a better method be found we must continue to fight caries by the best prophylactic and reparative measures which we can command.

In the meantime the subject must be left an open question. Investigations should be carried on by every man who is able to give the matter his attention, and his results should be published in such a manner that they may be of aid to other investigators and instructive to the practitioner of dentistry. Let us, then, work together, following the slogan of the *Cosmos*—"Observe, compare, reflect, record"—and strive toward the goal of a fuller understanding of this great question.—*The Dental Cosmos*.

SOCIETY MEETINGS.

TORONTO DENTAL SOCIETY.

THE final meeting of the Toronto Dental Society for the present season was held on the evening of Friday, 26th April, 1912. The chair was occupied by Dr. A. D. A. Mason, President of the Society, who extended a welcome to the many guests present.

The programme consisted of an address by Dr. C. N. Johnson of Chicago upon the subject of Oral Hygiene in Its Relation to the Community and Public Health. Dr. Johnson, at the conclusion of his address, exhibited a number of lantern slides illustrating the work of Dr. Frederick Noyes, in colored photography. The evening was a delight to all the members who were present and was particularly appreciated by those who are interested in public health problems.

Dr. W. J. S. McCullough, Chief Health Officer of Ontario, was present; also Dr. W. E. Struthers, Chief Medical Inspector of Toronto Public Schools.

Dr. Wallace Seecombe and Dr. A. W. Thornton moved and seconded a vote of thanks to Dr. Johnson, which was given hearty approval, as were also the words of welcome extended to Mrs. Johnson, who had made the trip to Toronto along with Dr. Johnson.

Dr. Johnson paid tribute to the medical profession for the assistance they had given to the oral hygiene campaign, and referred to the fact that the medical and dental profession standing together for prevention presented a noble spectacle of unselfish service for humanity. Reference was made to the pioneers who had blazed the way for the success attending the oral hygiene campaign of to-day, and a most optimistic view was presented of the widespread public interest to-day and the splendid possibilities of the future.

At the very outset Dr. Johnson spoke of the need of school inspection and home training. In connection with the establishment of public dental infirmaries for the poor Dr. Johnson warned the profession against their establishment without proper provision for their maintenance. It was pointed out that infirmaries depending upon voluntary service by dentists were most unsatisfactory, and at best was but a temporary expedient.

Dr. Johnson stated his view that the oral hygiene campaign

would ultimately be recognized as a public health measure and would be undertaken, as such, by public health bodies, and urged that under an ideal arrangement dental infirmaries should be maintained by the State. In Chicago voluntary infirmaries had been in operation for some time, and recently a wealthy citizen had undertaken to provide for the entire maintenance of a number of other infirmaries until such time as they would be maintained by public funds.

The speaker referred to many interesting facts which went to show the public need for oral hygiene. It costs Chicago \$300,000 annually because of the children who miss their grade, failure being directly traced to diseased conditions of the mouth. An epidemic of scarlet fever continued indefinitely until the authorities realized that the children upon being discharged as cured carried the scarlet fever germs in decayed teeth and thus caused the infection of others. When the mouths of the children were made healthy before their dismissal from the hospital the epidemic was controlled and ended.

Reference was made to the ruthless extraction of first permanent molars (symmetrical extraction so-called) and the evil results which are but multiplied in ratio to the number of molars extracted.

Dr. Johnson described Fletcherism as being a use of the tongue as a compressor of the food and a "juice extractor" rather than merely a thoughtless mechanical moving of the jaws a given number of times. Horace Fletcher tastes and enjoys every mouthful of food. Mastication is accomplished by the teeth plus the strong pressure of the tongue against the lingual surfaces of the teeth. The juices and taste are all extracted from the food and it readily becomes fluid and "swallows itself."

In conclusion Dr. Johnson referred to the fact that departments of government were established for the maintenance of the health of domestic animals, and predicted that public health would occupy a more exalted place in the work of government as the people were educated to the value to be derived from the establishment of Departments of Public Health.

EASTERN ONTARIO DENTAL ASSOCIATION.

THE annual meeting of this Association was held in Ottawa on May 1, 2 and 3. Papers were read by Dr. Mildred Hanna, Ottawa; Dr. A. E. Webster, Toronto; Dr. W. C. Davy, Morrisburg; Dr. Harold L. Watt, Ottawa, and Dr. W. H. Doherty, Toronto.

The attendance was probably the largest in the history of the Society. At the session devoted to Oral Hygiene, the Inspector of Schools of Ottawa and members of the School Board were present by invitation.

On the evening of May 2 a complimentary banquet was tendered the guests. The open-hearted hospitality and professional enthusiasm of the members of this Society are so much in evidence at all times as to seem to disprove the old physical law that two things cannot occupy the same place at the same time.

FREE CLINIC AT OTTAWA.

UNDER the auspices of the Ottawa Dental Society a free dental clinic is now in operation at the Protestant General Hospital, during one-half day per week, manned by volunteers from the members of the Society.

OUR NEXT ISSUE.

THE next issue there will appear an article by Dr. Charles M. Hodgetts, Medical Adviser, The Commission of Conservation, Ottawa.

NON-OXYDIZABLE GOLD.—"Non-oxydizable" 22 k. gold plate makes a better inlay and looks like pure gold, and is a great convenience in other work. Ask your dealer for it.—*M. R. Harned, D.D.S. (Review).*

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Vol. 2

TORONTO, JUNE, 1912.

NO. 6

EDITORIAL.

MUNICIPAL DENTAL INFIRMARY IN TORONTO.

A FEW weeks ago the Toronto City Council voted \$4,000.00 for the maintenance (for the balance of 1912) of a municipal dental infirmary. This grant is equivalent to \$7,500.00 per annum.

About a year ago the Board of Education appointed Dr. W. H. Doherty as Dental Inspector of Schools. Dr. Doherty's work has necessarily been largely preventive and educational, the Board not having provided an infirmary where dental operations could be performed. A great deal of work, however, has been done for poor children through the kindness of individual practitioners, by resort to the public clinic of the Dental College at Toronto, and extracting, where possible, in the schools.

The oral hygiene campaign in the schools has centered around the idea of "every child with a healthy mouth," and the result has been to place upon the Board of Education a moral obligation to provide some means of caring for the dental needs of the poor.

Mr. A. C. Lewis, Chairman of the Medical Inspection Committee of Schools, along with a number of dentists and other public-minded citizens, presented the matter to the civic authorities, when

it was urged that, while the school authorities might properly undertake dental inspection and instruction, it was clearly a civic project to supply hospital care for the poor. The result of several conferences was that the Citizens' Committee undertook the equipment of the infirmary, while the City Council agreed to maintain it. The intention is that children who attend properly accredited will be given dental services free. Operators' salaries and all other expenses will be paid by the city.

The successful launching of this civic infirmary is an example of what may be accomplished by a few earnest men who see the need and who do not hesitate to make personal sacrifices that the need may be met.

The several Educational Committees of the dental profession in Ontario, and particularly the Toronto Committee, are to be congratulated. They are working along lines that will give permanency to the oral hygiene movement, and which tend toward the recognition of oral hygiene as a public health measure.

The time is not far distant when the state will assume the same position toward dental disease as it now does toward every other great menace to public health.

EVERYTHING READY.

THE above was the prompt reply received from Dr. J. A. C. Hoggan of Hamilton in reply to a query as to the Burlington Convention programme and arrangements.

In addition to the splendid programme of papers and discussions, there is a list of fifty clinics.

The manufacturers' exhibit will be on a large scale, over twenty-five dealers having already arranged for space.

Secure single railway ticket and be sure and obtain from the agent a standard railway convention certificate and present same to the committee upon registration. If you decide not to stay at the Brant House, excellent accommodation may be secured at the Royal, Waldorf or Stroud Hotels, which are located in the city of Hamilton. Those who stay in the city will enjoy a lovely half-hour trolley ride around the Burlington Beach to the Brant House. There will be little inconvenience, as the cars run every twenty minutes.

Golf-sticks, bowls, and bathing suits are in order.

Come prepared to have a most helpful and happy time. This is going to be the best dental convention ever held in Canada. Don't miss it.

EXHIBIT FROM THE DR. W. H. CUSHING MUSEUM,
UNIVERSITY OF SOUTHERN CALIFORNIA.

A VERY interesting feature of the convention to be held at the Brant House on June 3, 4, 5 and 6 will be the exhibit of a collection of "operative procedure specimens and anomalies of extracted teeth," from the collection of Dr. W. H. Cushing, University of Southern California.

In this collection will be seen some very odd shapes of bridgework, crowns, fillings, and also very interesting specimens of the natural teeth.

As this is the first time that such a collection has been shown at any of our conventions it will be of great interest to all.

A dental museum is made up of specimens of operative procedure—old instruments or utensils used in the laboratory—chunks of calcis deposit—teeth with very curved roots—abnormally large teeth—supernumerary teeth—dichotomes—abrasions—casts of atrophied teeth, erosions or cleft palate.

The museum of the R. C. D. S. is in need of specimens of all kinds which will be of interest, and there must be many such pieces around Canada which if collected and properly tabulated would be of interest to all.

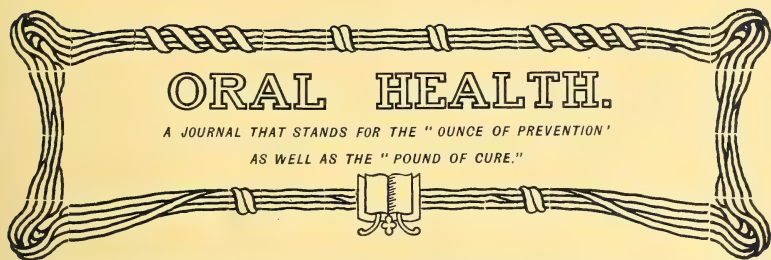
The accompanying cut illustrates a few of the peculiar forms of extracted teeth, and any contribution to the museum of the R. C. D. S. will be properly tabulated and credit given to the donor.



PROFESSORSHIP VACANT.

Applications for the position of Professor of Crown and Bridge Work in the School of Dentistry of the Royal College of Dental Surgeons of Ontario, vacant by the resignation of Professor A. W. Thornton, will be received by the undersigned up till June 30th, 1912.

J. B. WILLMOTT, Sec. R. C. D. S. of Ont.
96, College Street, Toronto



Vol. 2

TORONTO, JULY, 1912.

No. 7.

THE EDUCATIONALIST'S INTEREST IN THE CHILD'S FIRST QUINQUENNium OF LIFE.

By CHAS. A. HODGETTS, M.D.C.M., L.R.C.P., Lond., D.P.H., F.R.
San. I., Medical Adviser, The Commission of
Conservation, Ottawa.

SO much has been written and said of the medical inspection of school children that many have come to consider the movement as one which would rectify all the physical, mental, and moral defects of childhood, no matter how they are caused. In other words, the greater portion of the public are satisfied that the state has found a panacea which will atone for the sins of the parents, and by adopting the principle they have relieved themselves of a personal responsibility, conferred a blessing upon posterity, and placated the Almighty for sins of omission as well as commission. This transferring of responsibility from the individual to the body corporate has its limitations, and it is a question if, in this respect, it has not gone too far, and it might not be as well for the state to take the position that parents should be held criminally responsible for many of the physical defects of their offspring. It is surely just as rational to place upon the statute book a law for the non-support of a child and enforce it against its parents as to require that the parents of a child should be responsible for its care during the years of its physical development. Do not think by this comparison I am advocating more law—quite the contrary. I believe that by a better and a higher education we should, and can, deal with both of these important questions which are daily confronting us. But that education must be upon lines altogether different from anything that is to be found in the curriculum of any public or high school, college or univer-

sity. Boys and girls, young men and maidens, must be educated in the duties and responsibilities of fatherhood and motherhood; they must be grounded in the principles of sexual hygiene, and have the degree of doctor of manhood or womanhood stamped upon their characters, for it is quite apparent that a knowledge of these principles is not conferred upon children by the Creator when He breathes into them the breath of life. It is time we realized the fact that the most important part of our education has been left to chance; that the masses of mankind and womankind are to-day—in the twentieth century—in many cases less accurately informed as to the duties and responsibilities of parentage as were our ancestors of the middle ages.

Our parents have said, "Oh, John and Mary will find out these things when they get older!" and we of to-day are following on the same lines. Why? Because it is easy and less troublesome. In these so-called Christian days man has discarded what, in the prophetic days, was a part of the people's religious teaching. It is quite evident from parts of the Old Testament that the Jews were taught many things which properly come under personal and sexual hygiene. Such subjects are taboo to-day for the reason that they are delicate and thought improper in this enlightened twentieth century. Possibly the Almighty was correct in setting them down in the books of Moses for the information of the poor, benighted Jews, but for us—oh, no! quite improper!

Few parents understand child life, and still fewer understand the life of the child, and yet the child is the life of the nation and the nation's life. If Canada is to be what we in our bursts of national enthusiasm predict it will be, then we must, as individuals and as parents, take infinitely more thought of these things. Perhaps, as a people, we have, during the past year or two, dwelt too much upon the question of the systematized medical inspection of school children. We may have lost sight of the fact that most of the injury we have been striving to correct has been done at home, previous to the child coming under the purview of our compulsory education laws. It may be that some parents have favored the system for selfish motives, thinking thereby they will be relieved of personal cares and responsibilities, making their own burdens the lighter by thrusting them upon the officials of the municipality. This may seem a rather severe way of stating the case, but we cannot deny the fact that the tendency of the present day is for parents, in too many instances, to shirk personal responsibility. Too many women of the present day—parents, too—have devoted more time to the study of the intricacies of the game of bridge whist than they have given to the study of the still more difficult question of how to bring up the baby. As to how little time or

thought they have bestowed upon the health and physical well-being of the child it is not hard to guess. In this connection I would quote the words of an English lady* of rank, which appears in an excellent article on "Some Nursery Training," where her ladyship refers to the training of girls:

"In the richer classes far too many spend all the afternoons, and the evenings till midnight, gambling at bridge, and try to get themselves out of debt by further gambling in the stock exchange."

This parental neglect bred of ignorance savors of crime more than of indifference. It is safe to say that if the parents of this province had been alive to their duties to their offspring there would be less need for this demand for medical inspection of the school children. We have not in Canada that degree of poverty which is to be found in other countries. Extreme poverty necessarily means that thousands of infants and children often have not the food, in either quantity or quality, sufficient to satisfy the demands for their physical growth. From reports already received from some of the centres of population as regards physical and mental defects of our school children it is quite evident to my mind that many parents are of the criminal class. They may not come under the bann of the Criminal Code, but that is a mere difference in degree not in kind. Nor is ignorance of the law an excuse, whether that law be a human one relating to the physical growth and development of the child or a moral one.

I would carry the thought still further as to medical inspection. We must not let it overshadow or dwarf the importance of the education of the rising generation in respect to all that appertains to the child. Most of the present generation of parents are hopelessly damned to flounder in ignorance. And why must they flounder thus? Simply because they have been taught, as many of us have been taught, that grammar, arithmetic, the sciences, the languages—dead and living—and a score of other things, are the essentials—the all in all to make men and women. Our imperfect educational system does not, and will not, educate any child, be it male or female, to fill its position in the state, whether that position be lived out in celibacy or in a married life.

Referring again to medical inspection. It is a measure which, in the main, should only be considered as a tentative one, for if we believe in education along the proper lines it must be so considered. With a nation of higher and better educated men and women that portion who take upon themselves the duties of parentage will raise up such healthy offspring that there will be but a small percentage to be looked after by the municipality when they reach

*Lady Massie Blomfield.

the school age, and many of these will be attended to by municipal officers before they come under the care of the teachers.

It is almost a superhuman undertaking to educate the parents of the present day, for, as previously stated, many of them are past redemption. But if some of them can be educated, and thereby induced to devote the care they should to the physical upbringing of their offspring, then it is your duty and mine to endeavor to do so. How best to accomplish the most good is not a theme for discussion in this paper, but certain it is the work of education in the duties and responsibilities of fatherhood and motherhood must be seriously undertaken. An association of teachers such as this is directly interested in the subject, and should by every means possible urge on and assist in the good work.

The situation at the present time as regards the number of children born in Ontario is this: Not less than fifty thousand children are born each year. Naturally they are the wards of their parents for the years following birth until they come by statutory requirement under the purview of the educational authorities. What, then, is the history of this important period of their lives?

Table 1 shows the number of births reported in Ontario for each of the five years—1901-1905, inclusive—(column a) and in columns b-f, inclusive, are the deaths of the children born in the year as stated in column (a). For instance, 44,953 births occurred in 1901; 5,435 died in that year, as shown in column (b); then 844 died in 1902, 515 in 1903, 261 in 1904, and 244 in 1905, or a total of 7,299 out of the 44,953 born in 1901 died before reaching the school age. Of course, the figures can only be taken as approximate, for allowance must be made for the fact that it is impossible to follow up and trace out the record of each child born in 1901. The figures, however, indicate that at least 15 per cent. of all children born in this province die before they reach the school age.

TABLE I.
DEATHS IN FIRST QUINQUENNIAL OF LIFE
ONTARIO, 1901-1905.

Year	(a) No. of Births	(b) Under 1 Year	(c) Age 1-2 Years	(d) Age 2-3 Years	(e) Age 3-4 Years	(f) Age 4-5 Years	TOTAL		Percentage	
							Deaths	Living	Deaths	Living
1901	44,953	5,435	844	515	261	244	7,299	37,654	16.23	83.76
1902	47,796	4,852	793	413	304	210	6,572	41,224	13.75	86.26
1903	47,477	5,435	735	441	269	208	7,088	40,398	14.92	85.08
1904	48,575	5,212	851	376	299	252	6,990	41,585	14.90	85.01
1905	50,288	6,071	628	396	282	209	7,586	42,702	15.08	84.92

Taking the figures for the year 1909, we find the causes of mortality in infants under one year to be as stated in Table 11. Of the 6,932 no less than 3,345, or 43.2 per cent., died in early infancy from causes, many of which may be considered as preventable if the mothers had but known how to properly take care of themselves during the prenatal period. The next most fatal period to the infant is that of the months of lactation, for 1,510 babies died from digestive troubles; or, in other words, 21.8 per cent. of all those who died were lost mainly through maternal ignorance. Thus this large number of innocents were slaughtered, and the state deprived of an invaluable assets. There must be added to these the 702, or 10.1 per cent., who died of diseases of the respiratory system, for it must not be forgotten that, with due care of the young offspring in the way of proper protection, even in this severe climate, many deaths from these diseases could be prevented.

TABLE II

SYNOPSIS OF CAUSES OF DEATHS (Infants under 1 year)

Total 6,932

PROVINCE OF ONTARIO, 1909

CAUSES OF DEATH				
Diseases of Circulatory System	-	-	-	16
,, Respiratory System (Total 702)	{	Acute Bronchitis	-	163
		Bronchial Pneumonia	-	247
		Pneumonia	-	243
		Total	-	653
,, Digestive System (Total 1510)	{	Diseases of Stomach	-	258
		Diarrhoea & Enteritis	-	1184
				1442
,, Genito Urinary System	-	-	-	28
,, Skin	-	-	-	12
,, Bones, etc.	-	-	-	1
,, Malformations	-	-	-	307
,, Early Infancy (Total 3038)	{	Congenital Debility	-	2582
		Other Diseases	-	350
		Lack of Care-	-	106
,, External Causes	-	-	-	26
,, Ill Defined Causes	-	-	-	406

For another phase of the question Table 111 shows the difference in the infant mortality as between the city and the rural districts of the province in 1909. It is quite apparent from the statistics that the babe born in the city has fewer chances of living twelve months than the baby born in our rural districts. Can it be said that the wife of the farmer is better educated than the wife of the town dweller in all that appertains to either herself or the duties of motherhood? Certain it is that the physical status of the average country woman is better than that of her sister in the city, and it may be that the former assumes with more grace and ease the duties of maternity, and that there are fewer artificially

TABLE III
INFANTILE MORTALITY—ONTARIO, 1909

	Births	Deaths (Under 1 Year)	Infant Mortality (per 1000)
Province	52,629	6,932	131.6
Cities	16,887	2,830	167.5
Towns	2,985	426	142.7
Rural Districts	32,757	3,676	112.2

fed infants in the rural districts than in our cities. We can be sure of this: That the artificial infant's food in the cities is not as pure as it is on the farm; and, in the interests of the babies, the standard for pure milk must be raised before marked improvement in this respect can be looked for. The heavy mortality rates in our cities certainly indicates that the difficulties and responsibilities of parentage increase in proportion to the complexities of environment. In this particular the teacher of the city school is especially interested, as well as every other class of the community.

With these figures before us it may be as well to consider something of the nature of the child during the years when it should be in the making of the mother and father, for I do not wish to disassociate or divorce these two important factors in the education of the child. The child is what the parents make it, not so much what the teacher makes of it. The first five years of life is the period of growth and development, and therefore the child may very properly be considered from a physiological standpoint. For convenience let us discuss this standpoint briefly under three groups: (a) The growth of the body generally; (b) the development of special functions; and (c) metabolic changes.

THE PHYSIOLOGY OF GROWTH.

The process of growth in the infant consists of more than an addition to its weight, height, and volume. It involves alterations in the relative size and weight of its every part, as well as in its chemical composition, all of which indicate that its various physiological functions are undergoing quantitative as well as qualitative changes. Some of these functions rise in importance, while others decline. The changes do not occur spasmodically, but take place from day to day. Each change affects the general physiology, and each produces an influence on other and possibly remote parts of the body. As an example, the child is beginning to walk, makes use of muscular contractions, and thereby produces an augmented volume of dioxide gas; this, in turn, must be eliminated by the lungs, and, as a consequence, the pulmonary circulation is accelerated. This implies an increased action on the part of the heart, which means a quickened systemic circulation. This increase in the systemic circulation means a stimulus to each organ, which, in turn, calls for extra nourishment, resulting in activity and growth of the whole of the organs of the body.

It is not the province of this paper to discuss at length the phenomena of growth, but it may be indicated that these may be studied from four standpoints, viz.: (1) The changes in the skeleton and in bodily proportion; (2) growth as shown in height; (3) growth as shown in weight; (4) growth of the individual organs. And from all of these standpoints it will be seen that marked and important changes are evident during all the periods from birth to manhood or womanhood, the most important occurring during the first five years of life.

THE PHYSIOLOGY OF SPECIAL FUNCTIONS.

Associated with the bodily growth of the infant there are marked changes in the organs of digestion, in the circulatory and respiratory systems, as well as in the kidney and the gland structures generally, but the subject cannot here be enlarged upon. Reference, however, may be made, by way of illustration, to the lymphoid tissue, where the infant endeavors to protect himself from infection by bacterial diseases with which he is surrounded. The natural immunity bequeathed to the infant by his mother rapidly declines, and for this particular function the infant depends largely upon the lymphatic glands and the other collection of lymphoid tissue. It is on account of the frequent demands made upon the glands in direct functional relationship with the mucous membrane, particularly that of the mouth and nose, that hypertrophies occur in these regions, and thus are produced enlargements of the tonsils and the growth of adenoids. In a lesser

degree the entry of these pathogenic organisms by way of the lungs and intestines is opposed by the bronchial and mesenteric glands.

THE PHYSIOLOGY OF METABOLISM.

Owing to the difficulty in study in the precise features of metabolism in infants considerable has yet to be learned. Up to the present much of our knowledge has been learned by what is termed the "statistical" method, which, at the best, is only approximate. We do know, however, that of the food consumed by the infant over 86 per cent. is oxidized and eliminated through the lungs and by the skin. Without considering the question at length, it is quite evident that the importance of food ingestion to animal heat has a marked bearing upon the feeding of the infant, for if the infant consumes four times as much food as he requires for his growth, then the food must be of the right kind and of sufficient quantity. In other words, the neat producing qualities of a child's diet are all important to his welfare. By the statistical process it has been determined the amount of mother's milk and artificial food necessary for each child at different periods of its growth. In this connection it must always be borne in mind that, while general rules may be laid down as to food ingestion, yet each case must be studied and considered separately if successful results are to be hoped for.

From the physiological factors we turn to the consideration of what may be termed the Psychology of Childhood. For an easier consideration of this science, which is wholly analytical, it may be as well to think of the mind of the newborn child as a blank sheet, upon which the simple lines are marked one by one and subsequently interwoven. Viewed in this manner, it will at once be recognized that the development of the mind depends largely upon the experiences of the child. This at once suggests the importance of environment as having a marked influence upon the mentality. Certain it is, the wider and more varied this is, the more quickly is the child likely to progress. To follow the babe from its birth, day by day, or indeed month by month, and study the changes which occur in its mental as well as in its physical development, would be most interesting if time permitted the review. But it must suffice to say that in the years preceding those of the statutory school age the processes of the growing child go on, and it is there the important field of work is to be found, a field as yet untouched, and one which is capable of possibilities such as have never yet been dreamt of by either sanitarian, educationalist or parents. The first five years at home is as the potter's room in which the clay is made and moulded and set, before it is passed on

to the, as yet, but imperfect educationalist's furnace and decoration room and later being placed in the public shambles. And as much depends upon the quality of the clay and the manner in which it is moulded and the form given it according to the use to which it is to be put, so is it with the child. The moulding is done in the home, and it is not until after he reaches the school age that the baking process begins and the decorative features are added. Of course we all know that even here flaws occur which may mar the beauty, the usefulness, or indeed the very life which the moulder's most skilful art has produced. It is by the system of medical inspection we are attempting to cull out the unfits who are not able to stand that uniform burning which is the bane of a system where it is a physical impossibility for any two to be alike.

A study of the deaths of children under six years of age in the Province of Ontario for the five years 1901-1905 inclusive shows that from 13.75 per cent. to 16.23 per cent. died before reaching the school age, or, to continue the simile, were destroyed in the moulding. The total deaths from all causes running from 6,572 to 7,299—of course the majority occurred in the first year of life—as will be seen from the accompanying table. As to how many of the remaining 83.76 per cent. to 86.25 per cent. were physically and mentally fit for school life, there is no means of at present ascertaining, but certainly a considerable percentage were passed into the schools of Ontario in a defective condition. That they were so received is not the fault of the teachers, but clearly the fault of those responsible for their upbringing, viz., the parents. That they are not all fit has already been demonstrated by the fact that in some instances throughout the province municipal authorities have already instituted more or less elaborate systems of medical inspection of school children. While the work is a commendable and a proper one, in my opinion, it is not, and should never have been considered as an educational one, but rather as a public health one in essence and in fact. Education is one thing; the health of the people is another, to be carefully considered and dealt with by a special class of scientific workers, who, however, must and should co-operate with the educationalists. But the two spheres of work are, when clearly understood, separate and distinct. The educationalist requires the knowledge to teach, while the sphere of the sanitarian is to prevent disease. For the latter purpose the sanitarian is given statutory powers to enter homes and examine individuals, and this duty rightly viewed from the standpoint of the conservation of human life, extends to the health of the individual—parents as well as for the child—from the period of conception.

One thing which we must carefully consider is the fact that by

the method at present in force in this province there has been created and is fostered a very important branch of public health work, which is being operated altogether apart from, and certainly not as an integral part of public health work. If it is so continued, it is liable, in the near future, to multiply the branches of public service rather than consolidate them, a course which, in my opinion, will be detrimental alike to education and public health.

If the educationalist wishes to have placed in his hands for the purpose of education boys and girls physically and mentally fit, then it is for him to place the subject in such a way before the people that our authorities shall begin to work in the right way. At present our educational authorities assume a burden which, in the main, can be materially minimized if the work is properly organized and carried out.

In conclusion there is one important feature of the young child's growth which stands out prominently and which is too often lost sight of in this generation, and that is the moral. It is referred to with a full appreciation of the difficulties and perplexities with which it is surrounded, yet to the teacher it means a great deal, for it is in the period of the child's attendance at school that evil effects in the child are in evidence, and perhaps it is this quality of the child that gives the teacher more anxious thought than any physical or mental defect. We hear so much to-day of the precociousness of the child, and parents shirk their responsibility in the early years of its life by consoling themselves with the thought expressed in these words: "Oh, all that nonsense will be knocked out of Tommy as soon as he goes to school," or "Teacher will see to this or that particular evil when he goes to school; she can do it better than I can; I needn't bother about it." This may be true in a sense, but it is an example of the parent shirking responsibility, and it is the duty of the parent to do the "knocking out" if, by the parent's negligence, it ever gets in.

One particular phase of this question which I wish to emphasize here—one which we as physicians and parents know exists—is that associated with the sexual functions. Too often parents shut their eyes to the fact that even before many children reach the school age, while they are at home under their parents' supervision, evil habits are contracted which, because of their secrecy, find a ready sphere for their development in the association of many children when at school. These lead to grave results both morally and physically, particularly as the child approaches the age of puberty. This is clearly a line of education for which the parents are directly responsible, and which no amount of argument can place upon the shoulders of the overburdened school teacher.

It will be advanced by some that all parents are not similarly situated in life, and some will fail in the discharge of their responsibilities to their offspring. This is an argument which must be admitted; it is a difficulty to be met, but this is all the more reason that the teacher should not be saddled with it. By the general education as to parental duties and responsibilities there will be a general uplifting, and consequently the net results will be for the good, and the teaching profession will benefit.

If the ideal for the parents is high as regards the physical, mental and moral standard of the child, the present difficult task of the teacher will be made less irksome, and the results from the educational standpoint be better, while from a national standpoint we will be building up in Canada a nationality which will surpass that of other nations, and will put forever out of the question the crumbling away of that which we are striving to perpetuate—the best nation that the world has ever seen.

BRODIE MEMORIAL.

Further contributions to the Brodie Memorial are as follows:

Dr. Badgley	\$ 1.00
Dr. G. G. Hume	2.00
Dr. W. Spaulding	1.00
Dr. Broughton	2.00
Dr. Thornton	1.00
Dr. T. N. McGill	1.00
Dr. Husband	1.00
Dr. A. W. Ellis	1.00
Dr. Arthur Day	1.00
Dr. C. B. Scott	1.00
Dr. A. A. Smith	3.00

At a recent meeting of the Liverpool Medical Institution, Mr. Thomas Guthrie read a note on the Recurrence of Adenoids, in which he pointed out that recurrence was seen most commonly operated on under the age of four years, even when the operation had been as complete as possible. Recurrence was not frequent in those between four and seven years of age, and practically did not occur in patients over seven when the operation had been thorough. Mr. Guthrie showed a photograph of the naso-pharyngeal tonsil removed from a child of three and of growth which recurred at the age of five. He pointed out that recurrence was favored by attacks of the specific feves, by congenital syphilis and by anterior nasal obstruction from bony deformities, etc. He urged after-treatment of posterior nasal catarrh and attention to the general health conditions of the patients.

THE RELATION OF MOUTH HEALTH TO CHILD DEVELOPMENT.*

BY W. H. DOHERTY, D.D.S.

THIS is said to be an age of specialization. This tendency is commendable just so long as it rests upon a basis of broad and fundamental knowledge. It has been unfortunate for the child that, while a perfect development, physically, mentally and morally has never been questioned as the ideal, specialization without that broad and fundamental knowledge has made it impossible. The teacher has been the specialist in mental development, the clergy in charge of the moral, with the physician and dental surgeon called in in emergencies.

The science of child development in its broadest and truest sense involves a knowledge of all three phases. The child will only come to its own when this is not only recognized but practised. It is worse than folly to attempt to "educate" a child while teacher and pupil are both ignorant of the fact that the mouth breathing is dulling its brain and sapping its vitality. Think of developing in a child a love for the beautiful and all the while its little mouth a mass of corruption and decay and the beauty of its features marred for life by the resultant irregular and misplaced teeth!

Looking back at my own experience as a public school teacher I can recall cases that to me at that time were enigmas: children whom I now recognize to have been hopelessly handicapped by some physical disability. Even at this date I can vividly recall the apparent stupidity, the continual colds, the typical adenoid face, the straining eyes and the fetor of breath and distorted teeth and features accompanying a mouth diseased.

What an uplift it would have been to me as a teacher and what a priceless blessing to these children and their parents had I then been able to point out some facts that I know at present.

If the records of medical inspection in any school be examined it will be found that the great bulk of the physical defects are in the respiratory tract. Of these the vast majority consist of diseased teeth and mouths, while of the remainder many may be, and some undoubtedly are, caused by mouth conditions.

*Read before the Ontario Educational Association.

The cause of the universally neglected and diseased condition of school children's mouths is self-evident. It is the common opinion among the laity that the child's first teeth are of little or no importance; that they must be lost ultimately to make way for the second set, and that efforts to preserve them are not necessary. The first teeth of the second set, "the six-year molars," come at six years of age, one on each side of the upper and lower jaws, just back of the last tooth of the first set. While these are the most important in the mouth, not one parent in a thousand recognizes them as teeth of the second set, and they are permitted to decay along with the neglected first teeth.

This practically universal neglect has produced mouth conditions in children so horrible as to beggar description. It is a common occurrence to find mouths so utterly filthy and diseased as to be a menace to the other children and a source of pollution of the air of the schoolroom. They are conditions that have to be seen to be appreciated. Mouths repulsive with filth and decay; hypertrophied and inflamed gum tissue; jagged and suppurating roots; cavities filled with "mouth garbage"; broken and decayed teeth containing the dead and putrifying remains of the tissues which formed the pulp of the tooth; frequently as many as four or five discharging abscesses, veritable pus factories, pouring continuous streams of pus into the mouth and stomach of the child; teeth covered with green stain and fermenting food particles; and in many cases as a direct result of this mass of infection, a throat blocked by adenoids and enlarged tonsils, and a tongue and fetor of breath giving striking evidence of the resultant indigestion and constipation in the intestinal tract. This is by no means an exaggerated description. Hundreds of cases of which the foregoing is a faithful picture may be found in the schools of any community. Although I have become somewhat accustomed to uncleanness in the mouths of school children, an inspection rarely passes that there are not cases of such extreme uncleanness and disease as to make one wonder that such conditions can be permitted to exist.

These conditions are not by any means confined to the children of the poor. Oral sepsis is no respecter of persons. Neglect produces the same effects in the child of wealth as in the child of poverty. Some examinations of kindergarten children in the schools of this city, including children from the poorest and from the wealthiest homes, showed the following results:

516 pupils examined, age 5—7.

90 only who even claimed to use a tooth brush, the evidence in many cases being lacking.

2624 cavities in the first teeth and 413 prematurely lost.

- 128 "six year molars" decayed and 6 lost.
- 256 discharging abscesses. An average of one for every second child.
- 206 only, or less than half, able to masticate well.
- 53 entirely without masticating surface.
- 82 mouths only that were comparatively clean.
- 222 mouths particularly unclean.
- 42 children with irregular second teeth resulting from loss of first teeth.
- 22 only had ever had dental attention.
- 29 mouths free from decay, or 11.4 per cent.

At no time in the life of the individual is nutrition of such paramount importance as during childhood. The young child is expected to double its weight over and over again until maturity. In addition to this great physical contract, it is expected to enter the kindergarten with a mind just beginning to unfold and in a comparatively few years to have grown mentally to a sufficient extent to enter the university, and on top of all this to have developed the moral fibre necessary to uprightness and good citizenship.

It would be needless to argue that a child deprived of food would die. It should be equally needless to urge that a child deprived of its means of getting full value from its food is seriously handicapped in its development.

If you desire to sell a horse or dog to your neighbor the first thing he does is to look at the mouth of the beast. If the teeth are bad he does not buy. He knows that with poor teeth the value of the animal is destroyed. The most ignorant Indian knows all this and buys or barter accordingly. A horse with a mouth like that of the average school child would be absolutely valueless. The child's mouth is just as true an indication of its value, not in dollars and cents, but in the elements of citizenship.

The child's first teeth are all in place—20 of them—at about 2 years. For the next four years the child is entirely dependent upon them for mastication. At six the four "six year molars" arrive, the first of the second set, as an aid in mastication while the first teeth are gradually being replaced. These should be gradually lost until at about thirteen all the second teeth are in place except the third molars or wisdom teeth. Thus it will be seen that a child is wholly or partially dependent upon its first teeth for about seven years. The tremendous handicap to a child when these teeth are lost at an early age, as they often are, can be imagined. In addition to the inability to masticate there is the contamination of the food with pus, fermenting food and disease germs, all pro-

ducing indigestion, constipation and generally lowered vitality. Over 60 per cent. of the cases of anemia are directly traceable to unclean and septic mouths.

It is commonly recognized that anything which lowers the vitality for any considerable period may be a predisposing cause to tuberculosis. In this respect the mouth conditions of many children stamp them as ready victims to this disease. Examinations show that from 35 to 60 per cent. of school children are affected with swollen lymphatic glands, from the size of a pea up to that of a pigeon's egg, and some larger. These enlarged glands are found on the same side of the neck as diseased teeth. Where a tooth has developed an abscess or "gum-boil," as it is commonly called, invariably a swelling can be detected in the glands on that side of the neck, due to the infection from the diseased tooth or teeth. Many of such glands have been proven to be tuberculous, and where there was no other evidence of tuberculous infection elsewhere. There are numerous records of investigations which show conclusively that tubercle bacilli enter the glands of the neck through decayed and abscessed teeth and create a focus of infection, whence the disease may spread to other parts of the body.

With reference to the other infectious diseases, we must remember that most disease germs enter the body through the mouth. Over twenty varieties of disease-producing bacteria have been found in the mouth, among them being those of diphtheria, pneumonia, typhoid, cholera, tuberculosis, etc. Many of these bacteria thrive in the mucous membrane and in cavities in diseased teeth and are capable of multiplication before entering the body. Not only at the commencement of disease, but also at its conclusion, when the patient has looked upon himself as restored for a considerable time, germs of the disease may be met with in the mouth which are completely virulent and capable of producing the disease. It becomes self-evident then what an important factor is a clean mouth both in the prevention of the infectious diseases and as a prophylactic measure in avoiding the spread of infection after recovery.

In the group of infectious diseases known as children's diseases" it is a remarkable fact that in practically every case the seat of infection is in or near the mouth. In measles, for instance, the first symptom occurs in the mouth, the small red spots with bluish white point in the centre—the so-called "Koplik's sign"—while recently it has been discovered that the last place from which infection may be obtained is the mouth. These diseases occur as a rule while the first teeth are in place and are being replaced by the second set, a time at which, owing to the prevalent neglect,

the mouth becomes a hotbed of micro-organic life. That this is a mere coincidence is hard to believe, and I am convinced that there is a definite relationship between the prevalence of these diseases and the unclean and diseased condition of the mouths of the majority of children at this period. This conviction has been strengthened by the knowledge of the comparative immunity of a number of children whose mouths have been cared for since infancy.

The shape of the lower part of the face is dependent upon the position of the teeth. The bone which holds the teeth in place is formed as the teeth erupt and is molded about the roots in whatever positions the teeth may come. Anything which destroys the normal arrangement of the teeth has a corresponding effect on the contour of the face. Mouth-breathing narrows the arch and causes the upper front teeth to protrude. Loss of the first teeth stops the normal growth of the jaw and the large second teeth find a baby jaw, with all the crowding and distorted features which result. Loss of the six-year-molars shortens the face, produces a pouting of the lips and other characteristic deformities. Thousands of children have their features maimed for life owing to some one or more of these causes. The receding chin and apparent weakness of character expressed in many faces are often due to wholly preventable causes. If parents and teachers recognized these facts the features of many a child might be preserved in their beauty where now they are distorted out of all resemblance to what they might have been.

I have thus far spoken only of the physical effects of faulty mouth conditions. All of these physical conditions, however, have a corresponding mental and moral effect. It is plain on the face of it that the child suffering from indigestion, malnutrition, septic poisoning, etc., the results of a diseased mouth, will be unable to do itself justice in school. Many of our children are misunderstood both at school and at home and overworked when they are backward, while every day they are tearing their little hearts out unable to interpret the complex symptoms that are depressing them mentally and stirring up evil within them.

In dental practice we not infrequently have to deal with impacted teeth. Often a third molar, for instance, is turned on its side, and in its growth, instead of erupting, presses against the root of the next tooth in the arch, producing severe pains, which baffle the patient, and often even the dentist, until an X-ray picture shows the offending and misplaced tooth. When the first teeth are prematurely lost, stopping the normal growth of the jaw, the larger second teeth, in crowding into place, bring about a similar condition, which produces effects of a most serious character.

“The physiological activities going on in both jaws in connection with the exchange of the deciduous for the permanent dentures are in themselves sources of nervous stress, and when interferences occur which delay or obstruct the process an amount of peripheral irritation is set up which is the fruitful cause of many and serious reflex disturbances. Chorea, epilepsy, insanity, mental backwardness—all have their often unsuspected origin in impactions, infections, and malpositions of the teeth at the period under consideration. The results obtained at the psychological clinic of the University of Pennsylvania the studies of Dr. H. L. Upson, of Cleveland, and the work of many other observers, leave no room for doubt as to the dental origin of many cases of the difficulties named, and compel a recognition of the importance of appropriate dental treatment for removal of the source of the trouble.”

The most notable demonstration of the effect of mouth hygiene on the mental and moral development of juveniles has been in connection with the “Marion Street School Dental Squad,” in Cleveland. This was a special class of forty, having the worst mouths in the school. Their mouths were put in good condition, and tests before and after, together with their class records, showed an average gain in proficiency of over 54 per cent.

Miss O’Neill, the principal of the school, in a letter, says that in every instance the health has improved, the complexion has cleared, and with the attending physical uplift has come a self-respect that has made these children a very desirable element in the school, which is more than could be said of several of them before the work was begun.

One of these pupils was a degenerate, poorly nourished, anaemic, and the worst pupil in the school—rebellious, deceitful, and a truant. After having his mouth put in good condition, he is now regular at school, quiet, gentlemanly, and obedient. The gain in this case in efficiency was 204 per cent.

Other tests are now being conducted elsewhere along similar lines.

On the point of juvenile delinquency a most interesting contribution has recently been made by J. A. Colliver, A.B., M.D., medical probationer officer at the Juvenile Court, Los Angeles, California. He says he has a strong feeling that there is a physical basis for at least the beginning of juvenile criminality. In 1,000 cases he found 54 per cent. of the boys had irregular, notched, decayed, and aching teeth. The percentage of defective teeth was 10 to 12 per cent. more than among school children at the same age.

The conditions which bring about these serious consequences are preventable. The cause of their prevalence is a lack of knowledge of the facts I have endeavored to outline in this paper. When these facts are recognized as they should be, no child will be permitted to come to school with an unclean and diseased mouth, both for its own sake and the sake of its companions. Facilities for the treatment of the mouth of the child unable to pay a professional fee are not provided in this country. Illness in every other part of the body is provided for in the public hospitals, but the mouth is neglected. Most European countries—notably Sweden and Germany—make care of the mouth compulsory, and the state provides the necessary dental service for those unable to pay.

The greater part of the disease in children's mouths can be prevented by care in the diet and by regular and proper use of a suitable tooth brush. It is within the power of every teacher to become conversant with mouth conditions and their relations to health and development. If this is done and the knowledge imparted to parents and pupils, and every morning a clean mouth is expected and insisted on, the results will be among the most lasting benefits the teacher can bestow upon the child.

A GOOD INVESTMENT.—A good investment should be so compounded as to make it possible to pour it into the flask, and have plenty of time to know that the wax is thoroughly surrounded. A thin investment also allows the contained air more easily to escape. When I was using a thick investment and manipulating it hurriedly, as was necessary, I would find pimples on the gold far in excess of what I thought was caused by the contained air in the plaster ingredients, and I came to the conclusion that gases must be evolved after the investment was in its place in the flask. By making a proper mixture of ingredients it now allows me to manipulate the material so that any contained air or gases are allowed to escape before the flask is filled.—*W. H. Taggart, D.D.S., Chicago.*

ROOT AMPUTATION.—The amputation and extraction of the palatal root of an upper molar (in that large number of cases where this root is the only one affected by pyorrhea) is not a difficult operation, and will sometimes extend the usefulness and comfort of the tooth so operated on for a number of years. Needless to say the root canals of all teeth which are to be so operated upon should be carefully filled before the amputation.—*Arthur G. Smith, D.M.D. (Review).*

NEWER METHODS IN CROWN AND BRIDGE WORK.*

BY HART J. GOSLEE, B.S., D.D.S., CHICAGO.

THE full extent to which the application of the casting process may have revolutionized the practice of dentistry is, of course difficult to determine, but it is safe to say that its influence has been and is now being felt to a greater or less degree by even the most obscure dentists in the most remote districts.

Whether all who are now doing casting in some form or other are familiar with or will concede its revolutionary influence, and the marked advancement made possible by its application, or not, may be a question; but that at least a very large percentage of dentists are doing casting, and that they are doing better work, and doing it with infinitely greater comfort to their patients and with the expenditure of less nervous energy on their own part than they formerly did, there can be no question. That some operators are much more enthusiastic over its possibilities than others, and that some are getting much better results than others is also unquestionable, and is as interesting as it is true.

This, however, is but a natural sequence and should be expected in any field of effort in which former accepted practices and methods of long standing become so completely revolutionized—supplemented, if you please—in so short a period of time; where the pedestals upon which the cherished reputations of so many prominent practitioners were built have been made to crumble and totter almost in a day; where old and young must begin anew and alike, and where the application of this newer mode of procedure and its practicability must necessarily be tinctured with a saturated solution of personal equation.

From the beginning, however, it has been interesting to note that those who were early to grasp the possibilities of casting and, hence, who have been and are still doing the most of it, are the most enthusiastic over it, and, therefore, does it not naturally follow, by the same rule of thumbs, that those who were first to grasp and accept its wonderful possibilities, who have been and are still doing the most of it, and who are most enthusiastic over it, are also the ones who are obtaining the best results?

*Read before the Chicago Dental Society and the Illinois State Dental Society, 1912, and appearing in *The Dental Review*.

While it may be true that the proportion of those who ever attain to the very highest achievements in any mechanical pursuit is not a large one, still I am of the very firm belief that the casting process has afforded an opportunity for raising the standard, and increasing the percentage of uniformly good results; and, in the light of our present achievements, that this standard will become higher and higher in proportion as we recognize our own personal limitations, and realize the full scope of the possibilities of this process.

All who are sufficiently honest with themselves as to analyze and recognize their own limitations will not expect a mechanical process, or a machine of any make or kind, to adjust and adapt itself to the varying and intricate demands of an exacting line of work, unless the process is followed, or the machine operated, with an average degree of human intelligence, and those who fail to recognize this are surely destined to meet with failure.

Thus it is more than probable that many may have failed in attaining to the heights of even average success simply because they *expected* too much of the process involved, and *exactcd* too little of themselves, but those in this class never become enthusiasts, and those who never become enthusiasts never become experts, in any line.

Enthusiasm, expertness and all that goes with it, make for, and insure, *success* in the application of any mechanical process can, after all, come only from the "man behind the gun," and hence the operator who aspires to such must be willing to acknowledge and contribute his share. And in this instance his share is in the form of ammunition, and the ammunition now needed most of all is *correct and accurate technique*.

While the factor of personal equation will perhaps necessarily demand a more or less different technique for each and every operator, yet with each the most scrupulous attention to details and the utmost of accuracy is necessary; and as such a technique is to be acquired only at the expense of time, thought and energy, it is scarcely purchasable, nor may it result from delegating important parts of the work to laboratories, or to inexperienced or unskilled assistants, as is a common practice.

When the average operator realizes these essentials to success, then the average operator may reasonably hope to rise above the average, and to achieve success in the application of the casting process, and as he appreciates them will he also find the field of usefulness broaden, and the possibilities become more and more unlimited.

If there were, however, no field to which the casting process may be applied other than the one which embraces the filling of teeth, let me ask you what a long-felt want would it still supply; what a broad field of usefulness would it occupy; and what a priceless advancement would it mark in the preservation and restoration of the teeth, since it is now generally conceded that the inlay affords a better, quicker, less painful, and probably, on the average, more permanent character of operation?

Granting all of this to be true, however, the limitations of this process have by no means yet been reached. Indeed, it seems that it is still only in its infancy, and that the field of its usefulness as applied to all other phases of practical dentistry is as broad and far-reaching as is the degree and character of success already insured in the filling of teeth.

While this is undoubtedly true, to a greater or less extent, as applied to the whole field of dental prosthesis, it is particularly true as applied especially to the subject of crown and bridge work.

But a few—a very few—years ago this line of our work, which many of us are now pleased to designate and dignify as a “specialty” was but an indeterminable mass of empirical details. Almost every dentist had his own ideas, and his own methods, and each differed from the other to such an extent as to confuse the teacher, and bewilder the beginner, in every respect and direction except one—the display of gold.

For many years patients wearing crown or bridgework, however limited or extensive in character, were involuntary advertising mediums for dental jewelers; were forced to display shocking evidences of a handicraft which, while useful, perhaps, was usually far short of art, and always more or less repulsive.

These evidences, I am sorry to say, may still be observed, but fortunately not to the same extent. As a profession, we are beginning to strive for higher ideals in the artistic phase of our work, and in this respect we are aided materially by the demands of an ever-increasing degree of culture on the part of our patients.

Since porcelain has always been and is still the one substance which most closely simulates nature, and therefore best meets the requirements, the combined esthetic ambitions on the part of the dentist and esthetic demands on the part of the patient, must lead one to conclude that in an effort to satisfy each *more porcelain* and *less gold* must be used.

While this was recognized many years ago, still the inherent element of structural weakness so characteristic of porcelain, and

so often learned from sad experiences, together with the knowledge that cosmetics was but one requirement, and that in the construction of all forms of crowns and bridges the actual mechanical requirements of strength and accuracy of adaptation must necessarily receive first consideration, it is no great wonder that cosmetics was accordingly sacrificed.

If it were not, and if it is not, possible to obtain both of these requirements at one and the same time, then cosmetics should be placed second to, or sacrificed for the purely mechanical, but the possibilities of casting offer opportunity for obtaining all of the combined requirements to the very highest degree, and hence its application may be made to practically revolutionize all of our former methods.

This is possible because the casting process, *skilfully utilized*, insures, first, accuracy of adaptation, and, second, a maximum of strength with a minimum of gold; and in proportion as the amount of gold necessary to insure strength may be decreased, the amount of porcelain may be increased. Thus, if our work be properly constructed, less gold and more porcelain may be safely and successfully used, and the suggestions which I have to offer you along these lines are based entirely upon the theme of more porcelain and less gold, with equal and adequate strength.

Such manifestly desirable advantages are now to be obtained by means of a more general use of all-porcelain teeth instead of the ordinary thin facings, combined with a skilful application of the casting process.

You will probably agree with me that this type of tooth is preferable for single artificial crowns, because it affords better form, better color and greater strength than are possible to obtain from the use of facings. Also that an all-porcelain tooth is better for bridgework because the presence of an occlusal surface of porcelain instead of gold, on any or all of the posterior teeth, is advantageous not only for cosmetic and hygienic reasons, but for *actual masticatory purposes* as well.

These advantages are so evident that the more esthetic operator has been forced to look and hope for some form of tooth, and some method of application which would eliminate the inherent weakness of thin facings, and the objectionable features incident to their use.

To overcome the shortcomings of the so-called "Richmond" crown and of the ordinary bicuspid and molar dummy with porcelain facing and gold cusps, the advantages of some form of interchangeable or replaceable all-porcelain tooth, more closely simulat-

ing the form and color of the natural teeth, were early recognized. As a result of this recognition, many types have been introduced, but until very recently most of them have been of the thin facing variety, and applicable to the anterior teeth only.

While the all-porcelain tooth, such as the Davis, Logan and Justi crowns, has always been recognized as being the nearest approach to an ideal substitute for the natural teeth, yet they were not originally designed to meet the present requirements of crown and bridgework, and hence their use has been confined to that class of cases where more or less temporary results were all that was expected or demanded.

If the esthetic and hygienic advantages possessed by this type of tooth, however, could be combined with those of exact adaptation, and uniform and adequate strength, and if to these might be added the further advantages of being cemented to the basic structure instead of soldered, and of being replaceable and more or less interchangeable, it is evident that our efforts would be a nearer approach to the ideal.

In my opinion, which has been often expressed, the attachment of porcelain teeth or even facings to the metal structure by means of soldering, or of *direct* casting, is wrong. It is a wrong principle because the porcelain is subjected to a degree of heat which must endanger its structural integrity and influence the preservation of its color; because the tooth or facing is thus attached in a stiff and rigid manner, and, being friable, is more likely to fracture under the stress of mastication; and because, in the event of accident, no favorable opportunity for repair or replacement is usually afforded.

I think you will also agree with me, therefore, in that the elimination of these objectionable features must necessarily constitute an improvement, and that such an improvement is to be obtained by the use of replaceable teeth attached to the supporting metal structure only by means of cementation.

An experience of many years has proved that this means of attachment is reliable in proportion as the adaptation of the metal to the porcelain may be close and accurate, or, in other words, in proportion as the porcelain may be "boxed up," protected and supported. It is stronger when so attached because it is not subjected to any degree of heat, and is not held so rigidly, due to the more or less cushion-like effect afforded by the adhesion of cement over the entire surface of the porcelain; and because, not being held so rigidly, it is less likely to become fractured. Furthermore, the color is never changed; those dark blue marginal outlines so invariably present and due to the penetration of saliva between backing and

facing are absent, and opportunity and facility for replacement in the event of accident always present.

As I have previously stated, these possibilities and advantages are to be adequately obtained only in some form or type of tooth which presents as much porcelain as possible, this porcelain not being weakened by the presence of metal pins nor by the provisions for retention, and which, therefore, possesses a maximum of strength; which is of natural form, more or less universally applicable, and which will need but a minimum of grinding for effecting the desired and required adaptation.

This latter feature, as applied to the basal or retentive surface, is essential, because in proportion as a given form of porcelain tooth will require but little or no grinding upon this surface in effecting its adaptation to the requirements of the individual case, may it be expected to be replaceable or interchangeable.

These combined advantages, I believe, are to be obtained in a form of tooth suggested by your essayist, and now known as the "Goslee Interchangeable Crown and Bridge Tooth."

It will be observed that these teeth as now made are of natural form; that they possess the splendid strength and color characteristic of the Consolidated tooth bodies; that they are adapted to single crown work where any form of metal base is used, as well as to intermediate teeth, or "dummies" for bridgework; that they afford a minimum display of gold and require but a minimum amount of grinding, and that with a sufficiently large variety of molds they should be almost universally applicable; also that they are strongest where the greatest strength is required; and that they offer ample opportunity for secure retention to the supporting base or structure.

A further advantage made possible by the use of replaceable or interchangeable teeth, which applies particularly to especially difficult cases, is to be obtained by making duplicates, and while it is true that any form of interchangeable tooth is far less likely to become broken from the stress of mastication, yet the making of duplicates coincidentally with the initial construction requires but little time, is always a source of inestimable protection to the particular patient, and affords unlimited relief and satisfaction to the dentist. It is therefore a safeguard which might be observed often and profitably by everyone whose necessarily small fees do not render it prohibitive.

In all instances, however, whether duplicates are made or not, the color number and mold number of each tooth used in every case should be recorded on the card or ledger sheet, and thus made

a permanent part of the record. Because of these advantages and for these various reasons I firmly believe that only some form of interchangeable tooth should ever be used in single crowns, or in "fixed" bridgework, of any type, if the best results and highest possibilities are to be attained in our efforts.

METHODS OF APPLICATION AND PROCEDURE.

In addition to such desirable improvements as may be achieved by the use of teeth of this character, the introduction and application of the casting process has placed this field of our effort upon a more systematic and practical basis, as an evidence of which permit me to call your attention to the methods which I am now generally employing, almost to the complete exclusion of all other and former procedures, and which I am pleased to consider under the caption of "Newer Methods."

SINGLE CROWNS.

For the ten or twelve anterior teeth, or all teeth within the range of vision, where porcelain is demanded, the all-porcelain replaceable or interchangeable crown, *with cast base*, and with or without a band, as the requirements may indicate, is used in a very large percentage of cases. It is undoubtedly the strongest, most artistic, and most universally applicable type of substitute for the natural tooth, and in all respects is second only to a skilfully adapted "jacket" crown. Indeed, for the average dentist it is better and more quickly and easily made; and, moreover, it possesses an advantage over the latter in that immediate replacement in the event of mishap is possible.

PORCELAIN CROWNS WITH CAST BASE.

In the construction of all forms of porcelain crowns with cast bases much difficulty has heretofore been and is now being encountered in molding the wax to a close adaptation to both the root-end, *particularly at the periphery*, and the base of the crown, and at the same time have it hold the dowel or dowels in the proper position to insure correct alignment.

These essential features are usually so uncertain and in some instances so difficult and so unsatisfactory as to have caused me to devise and suggest a technique which eliminates any such uncertainty, which insures accuracy, which is applicable alike to all cases, whether a band is required or not, which makes the fitting of a crown to the most difficult root as simple as to the easy one, which relieves the patient of any discomfort whatever, and which, when used in connection with the Goslee tooth, has proven the most satisfactory method of crown construction I have ever followed.

In the various methods now generally used and advocated—and each operator has his own—good, accurate, reliable results are

difficult to obtain because the very plasticity of wax of any kind makes it possess a tendency to *spread* when subjected to the pressure necessary to mold it to a clean, close adaptation.

This inherent tendency has made it practically impossible for me to obtain a sufficient degree of accuracy of adaptation to the root-end with any wax, but may be entirely overcome, and absolute accuracy obtained in all cases by first adapting a cap of thin pure gold, or platinum, to the root-end. If this is carefully done, the surface thus obtained will always be a closer fit to the root than can possibly result from the molding of wax alone, with any investment material now procurable, and this surface will require no finishing whatever after casting.

Also, such a procedure reduces to a minimum the possibility of any change of form which may result from the warpage or shrinkage of the gold or alloy used in casting, which is a very important consideration. While the adaptation of the cap may be effected by burnishing directly to the root, the best, most accurate and least painful results are always to be obtained by *swaging*. This necessarily involves the impression and die, or indirect, method.

TECHNIQUE.

The technique involved, in sequential order, is as follows:

First.—Prepare the root in the usual manner, as for any type of porcelain dowel crown. If a full or partial band is desired, all enamel should, of course, be removed.

Second.—Adapt a base of thin pure gold (about 38 gauge) to the root-end, by *swaging* or burnishing. Platinum may be used if desired, but pure gold is more easily adapted by either method.

Third.—This adaptation is to be best accomplished by taking an impression of the root-end in modeling compound, investing it in plaster, and making a die of quick-setting amalgam or cement. An amalgam die is better than cement, because of being much more definite and reliable, though it requires more time. When the die has been obtained it should be trimmed around the periphery with a fissure bur until the root-end is freely exposed.

Fourth.—When so trimmed mount the die in the ring of any of the *swaging* outfits, with modeling compound, and with the soft rubber plunger swage a cap of 38 gauge pure gold.

Where the basal end of the root is smooth and flat, and no band at all is desired, the cap may be successfully adapted by burnishing directly to the root-end, but where a full band or any portion of a band is deemed advantageous or necessary, or where the surface of the root is concaved or irregular, the adaptation is to be best obtained by *swaging*.

The use of a cap previously adapted by either burnishing or

swaging, is advantageous, not only because it overcomes warpage and shrinkage, and insures a better fit of the finished crown to the root, but because it also facilitates sustaining the proper relation between the root, the dowel and the crown.

Fifth.—The next step is to select a tooth of suitable size and proper color. The selection of the tooth for the case at hand is best made by having a tray of sample moulds, and when one of proper size and form has been selected simply record the formula. Thus, for example, the record slip would read, "Upper Right Lateral, Mould 51, Color 65." If care is exercised in selecting just exactly the proper size and shape, practically no grinding whatever will be required.

In this connection, it would be better to select a formula just a trifle too small than one too large. If the exact size is not obtainable, small additions in length or width may be easily made in one bake, using any of the lower fusing bodies. Such additions are better than selecting a tooth which is too large and having to grind it, and little or no grinding should be resorted to, as these teeth are replaceable or interchangeable only in proportion as they may be used without grinding.

The formula of each and every tooth selected and used should always be permanently recorded in the ledger or card system for future reference, and in the event of necessity for replacement.

In the absence of sample moulds, an impression should be taken in wax or modeling compound, and a model made in plaster-of-Paris. The selection may then be made upon this model, but greater accuracy is to be obtained in the use of sample moulds directly in the mouth.

Sixth.—When the tooth has been selected, the canal should be enlarged to receive the dowel, which should be of a length which will enter the root to a sufficient depth and then engage and hold the tooth in its exact relation to the root. In single-rooted teeth a slight enlarging of the canal, or slight bending of the dowel, or both, will usually sustain the tooth in its proper alignment, and in upper first bicuspid one dowel is usually all that will be required, but this should be placed in the *buccal* canal.

Iridio-platinum or clasp-metal dowels should always be used for cast work, and should be round and not smaller than 14 gauge, though the end entering the canal may be *tapered* to conform to the size of the root.

Seventh.—When the dowel and tooth have been thus adjusted, the thin cap of pure gold should then be placed in position on the root, perforated to receive the dowel, and the latter, in position in the crown, forced to place. The tooth should then be removed and the relation between cap and dowel sustained with wax or tem-

porary stopping. The two should then be removed from the root and invested with a very small bit of soldering investment material. When this is hard, the dowel should be tacked to the cap with a small bit of 22 karat solder, which will insure their permanent relation. Cap and dowel should then be adjusted to position on the root and trimmed and burnished to the desired accuracy of adaptation.

Eighth.—The crown should then be ground to a close joint along the labial or buccal edge, and all other requirements of adaptation completed. When these have been observed the base of the crown should be painted with glycerine or thin oil, a small piece of soft clean wax placed on the cap, and the crown then forced to its exact position in relation to the cap. Crown, dowel and cap may now be removed from the root and the space between the gold cap and porcelain tooth completely filled with melted casting wax, preferably of a hard character. When thus filled and contoured all surplus wax should be nicely trimmed away, and the porcelain crown then carefully detached, which is made possible and easy by the presence of the lubricating oil.

No. 30 gold foil placed in direct contact with the porcelain tooth before it has been removed, the sprue-former should be *securely* attached to the thickest part of the wax. The crown may then be removed, the base invested and cast, always using a good grade of about 22 karat gold for the casting.

By a "good grade" of gold I mean that all gold used for this purpose should be at least 22 karat, and clean and free from contaminating metals and alloys. This will require that all scrap used must be previously melted and refined before attempting to cast it, if good results are to follow.

When the casting has been made, it should be cleaned in acid and finished. If duplicates are to be made, a crown of the same mould and color should now be ground to fit the cap. The original should then be cemented to the base and the crown polished.

Ninth.—Whenever it is absolutely impossible to have a single dowel fit the canal, and at the same time support the crown in proper position, the surplus end projecting through the cap should be cut off close to the cap, leaving just a sufficient length to insure strength. A separate short dowel such as is made for dummies for bridgework may then be used to support the crown, and should be placed in position in the crown, any unnecessary surplus cut off to permit of proper alignment, the porcelain then lubricated, and the relation sustained in wax, as previously indicated, where a single dowel is used. This is always better than to attempt to mold wax and cast the sustaining post as a part of the cap.

Tenth.—In cases where the space between the cap and the base

of the crown is very small, or where it may not be convenient or seem necessary to cast the base, good results may be obtained with solder.

In such cases the porcelain tooth should be backed up with 38 gauge pure gold by burnishing or swaging; the crown and backing then placed in position in relation to the cap, the porcelain removed, the case invested, and the space between cap and backing then filled with 22 or 20 karat solder.

This method is particularly useful in very short bicuspid, but where there is sufficient space to permit of casting, the results are perhaps more uniformly strong.

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This entire process reduces crown construction to a definite system, and one which requires but little time, which is simple, which insures a more or less perfectly adapted base, obtained without the slightest discomfort to the patient. If a full or even partial band is desired this latter feature is not possible when *burnishing* directly to the root-end is attempted.

For single crowns a slight lingual and proximal band is usually all that will be required. This strengthens the attachment between crown and root, and precludes the possibility of subsequent fracture of the root—for which purpose a band is usually used, but in all cases where the crown is to be used as a bridge abutment a *full* band should remain.

The construction of a crown by this method usually involves but three short sittings, and the best results are to be obtained by doing all the work directly in the mouth. At the first sitting the root is prepared, the root impression taken, the mould number and color selected, and a temporary crown mounted. This latter feature is desirable as a means of packing the soft tissues away to afford and insure a free exposure of the root-end at the next sitting, as well as to relieve the patient of the temporary embarrassment. The amalgam die having been made and the pure gold disc swaged and tooth selected *in the meantime*, at the second sitting the cap is fitted to the root, the dowel and tooth adjusted to the requirements, the dowel then soldered to the cap, and the relation between the tooth and cap secured with casting wax. The crown is then cast, the tooth cemented to place and finished, and the final mounting is made at the third sitting.

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GOLD CROWNS.

For second and third molars—and even first molars, when the presence of gold is not objectionable—the cast gold crown affords results far in advance of anything heretofore obtained. In the construction of gold crowns by the casting process, however, the fit

or peripheral adaptation is, because of the spreading tendency of wax, *always best obtained* by previously fitting some form of band to the root and then casting directly to it.

Whenever it is desirable to exaggerate the contour, a narrow band of platinum or 22 karat gold, of about 30 or 32 gauge, should first be made to fit snugly around the entire periphery and then trimmed to evenly approximate the end of the root, after which all of the contouring may be done in wax, which can be best done, perhaps, on a model.

When an exaggerated contour is not required, however, and it seldom is, the band may be made of 28 gauge, 22 karat gold, and fitted and contoured in the usual manner. When in position on the root, casting wax is then moulded to the end of the root inside of the band, and this procedure followed by an imprint in the wax of the opposing teeth in all of the movement of mastication.

After the band has been removed, its interior should be filled at once with casting investment material, and the occlusal surface properly carved, after which it may be invested and cast, using for the casting the same grade of gold of which the band was made.

If the band is thoroughly clean before investing, and the gold to be cast is of good quality and highly fused before casting, a good physical union will usually result, but if it does not, a small bit of 22 karat solder placed inside at the immediate joint will insure the same.

A thin disc of platinum foil placed inside of the band and over the end of the root just previous to moulding the wax will insure a smoother surface, and therefore a better seating of the finished crown after casting, than is to be obtained from investment material alone.

Where an exaggerated contour is desired, the best results are probably to be obtained by first closely fitting a platinum band, about 32 gauge, to the root, trimming this even with its occlusal plane, and then soldering a top to it, thus completely boxing up the end of the root with a close-fitting platinum cap. An impression and bite may then be taken, and when the models are obtained, all of the form and contour desired may be made with wax, and the casting made directly to the platinum cap.

These two general types of porcelain and gold crowns will meet the requirements of single crown work in a very large majority of cases, and the results are far more accurate than are to be obtained by any of our former methods.

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FIXED BRIDGEWORK.

In fixed bridgework, which constitutes an assemblage of attachments and intermediate dummies, our work may also be simplified,

because three general types of attachments and three general types of dummies will be found to meet the requirements in an exceedingly large percentage of cases.

Attachments.—The methods of obtaining attachment to the supporting teeth or roots embrace the *porcelain replaceable crown* with dowel and *cast base*, the construction of which has just been referred to, as applied to the roots of anterior teeth, or when it is impossible or inadvisable to preserve the natural crown; the *inlay*, when the attachment is to be made to the *crown* of a natural tooth, which is good practice when the remaining natural crown is sufficiently strong; and the *gold crown* for the molar teeth when the use of an inlay is for any reason not indicated.

As previously emphasized, wherever a dowel crown is to serve as an attachment for bridgework, a narrow band should always be used. In my opinion, this is absolutely essential because of the additional strain to which the root is to be subjected, and as a means of insuring permanency and precluding fracture.

When an inlay is to serve as an attachment, the cavity preparation is, of course, exceedingly important, and some form of post or posts should always be used to insure stability and as a provision against the inlay becoming loosened by the strain and possible torsion to which it is to be subjected.

The general applicability of the inlay as an attachment for bridgework has been a subject of considerable discussion ever since castings became an accepted practice. That it will serve the purpose as well as, and in some respects even better than, a full crown there can be no doubt, providing its adaptation and stability are insured.

The former depends, first, upon adequate and proper cavity preparation, and then careful technique in making the inlay; and the latter depends upon the use of a proper alloy in casting, and upon pins or posts of some form, for the reasons mentioned.

Wherever the walls of the supporting tooth are sufficiently strong to insure permanency; whenever a suitable cavity may be properly prepared, the inlay, well-seated and securely anchored, and made of a hard alloy, such as five per cent. platinum in pure gold, coin gold, or 22 karat gold, I am of the impression that such an attachment is often better than a full crown because of the absence of possibility of gingival irritation, such as is so often present where the latter is used.

The cavity preparation for such inlays does not differ essentially from that for a simple filling, excepting that its buccal, lingual and cervical margins must be so extended as to carry the margin between tooth and filling beyond any actual contact of the artificial tooth to be supported by it, in order that each and all of these margins may be exposed, for hygienic reasons.

“Dummies.”—As dummies for fixed bridgework, three general types will answer the requirements in all cases.

The all-porcelain replaceable crown and bridge tooth with cast backing is adapted to all positions in the arch where the conditions of absorption and occlusion will permit their use, and is undoubtedly the ideal form of artificial substitute. Backings for these teeth should usually be cast separately, though they may be made in sections involving the number of dummies between the attachments, which should never exceed three, or possibly four. Better form, larger and therefore more hygienic interproximal spaces, and less display of gold, however, are to be obtained by making each backing separately.

As a means of preserving the proper relation of the short sustaining post which holds the tooth to the backing, and of insuring a smoother surface adaptation of the backing to the porcelain than the ordinary casting investment materials afford, in using this type of “dummy” a thin backing of about 38 gauge, pure gold should be previously swaged to the tooth, and the post soldered to it. It is then always necessary to allow as much surplus end of post as possible extend beyond, in order to insure strength in the final attachment of this essential part to the completed backing.

Casting wax may then be moulded to the required form, and the casting made directly upon and against the thin gold backing, by which method any distortion or possible misfit due to shrinkage or warpage is overcome, as previously mentioned, and the most finished, accurate and reliable results are insured.

In the use of this type of tooth in all cases in the upper arch where complete absorption has already taken place, the most sanitary form of structure is usually to be obtained by moulding the wax so as to restore or approximately follow the lingual form of the tooth, but tapering down to a narrow saddle at the point of contact with the soft tissue. As a rule, and contrary to the opinions of some, however, wherever the adaptation is good, such a type of construction will be found to be far more sanitary than the usual recesses, shelves and pockets so common in the ordinary methods.

In the formation of this type of saddle, the desired results may be best obtained by first burnishing the same thickness of pure gold to the model, between the finished abutments in position thereon, and then trimming it to conform to the size of the necks of the teeth to be supported by it. The general form of the structure may then be made by filling in between this saddle and the backings with wax, after which the piece may be invested and cast. Or in instances where this space is *exceedingly small* it may be filled with solder.

In this more or less typical fixture it will be observed that practically no gold is displayed anterior to the second molar, and yet

that a maximum of strength presents throughout.

In cases where complete absorption has not occurred, a saddle is, of course, contraindicated, but in these cases the neck of the porcelain tooth should accurately fit and bear *firmly* upon the soft tissue, and the lingual surface of the backing should then be so formed as to be as nearly convex or self-cleansing as possible.

TECHNIQUE.

First.—In the application of the Goslee tooth to the construction of fixed bridgework, all of the crowns or inlays which are to be used in the support of the fixture should first be made separately.

Second.—These should then be placed in position on the supporting roots, or teeth, and an occluding “bite” taken in wax. When this has been obtained, an impression—always in plaster—should follow.

Third.—When the impression has been obtained, force each crown or inlay well to place therein and be sure that they are securely held in proper position. Then varnish and fill impression with a good soldering investment material.

In separating model from impression, be careful not to loosen or break off any of the crowns or abutment pieces, and when the model has been separated and properly trimmed, carefully adjust wax “bite” and mount upon articulator.

Fourth.—Select Goslee teeth of proper size and color. The selection can be best made with the sample moulds, fitting them to the model, and recording the mould number selected for each tooth separately. Care should be exercised to select teeth as nearly the proper size as possible. In this connection, observe the same precautions as to size and possible grinding as indicated for single crowns, and for the same reason.

Fifth.—When teeth of the proper size and color have been obtained, and any little grinding demanded has been done, each tooth should be backed up separately with 38 gauge pure gold. This may be done by either swaging or burnishing.

If the swaging method is used, fill the swaging ring with soft modeling compound and slightly imbed the tooth therein. By means of the soft rubber plunger and swaging press the backing may then be swaged directly to the tooth. When a swaging outfit is not handy, a good adaptation may be effected by burnishing. As soon as the backing has been properly adapted and all surplus trimmed away, perforate the backing to accommodate the small post which comes with, or may be made for, the tooth. Sustain the relation between backing and post with wax, remove from the tooth, invest and tack together with a small bit of 22 or 20 karat solder.

Sixth.—Adjust all of the teeth thus backed up with pure gold to proper positions on the model, using soft wax to sustain them. If the projecting surplus ends of the posts interfere, they should now be cut off, always allowing a sufficient length to remain to insure ample strength in their subsequent attachment to the finished backing. This should never be less than 1-16 of an inch, and for cast work this end should be “headed” by grooving or notching.

Seventh.—Moderately soft casting wax should now be added to each backing until the form, contour or shape desired in the finished piece obtains, carving each backing up *separately*.

The sprue-wire should now be attached, the porcelain tooth removed, the backing invested and the casting made.

The use of a thin pure gold backing on each tooth in this manner insures a proper relation of the short sustaining post, and a smooth, well adapted surface presenting to the porcelain, such as would not obtain if the tooth was backed up entirely with wax. It also overcomes any change of form which might result from shrinkage or warpage of the casting.

While backings for two, three, or even four teeth might be cast in one piece in this same manner, it is not advisable, because of this shrinkage or warpage, and less display of gold between the teeth, and all-around better results are to be obtained by casting each backing separately, and subsequently uniting them with solder.

The desired reinforcement of the backings and the general form of the lingual surfaces may be obtained with a high grade of solder, instead of casting, but greater and more uniform strength, as well as better form, result from casting.

Eighth.—When each backing has been made and finished, the teeth should then be placed in position therein, and all of the parts then assembled in proper relation on the model. This relation should be securely sustained with hard wax, melted against the backings and the model, being careful not to allow any of it to get on the porcelain teeth. All of the teeth should then be carefully detached from their backings, the spaces between each backing and the abutment pieces filled with soft melted wax to keep them clean, and the case invested for soldering. Great care must be exercised to have the case so invested as to insure the proper relation of the parts during their assemblage with solder.

Ninth.—When the investment is hard, all particles of wax should be removed with boiling water to insure clean joints. Small pieces of platinum or iridio-platinum wire should now be fitted into each joint. As these joints are necessarily small and solder is always more or less brittle, some reinforcement, such as strong pieces of wire, is regarded as absolutely necessary to insure ample strength. In this connection the utmost care must be exercised in obtaining

a maximum of strength in *every joint*, and particularly in the attachment of the abutment-pieces. It must be remembered that the strength of the porcelain in these teeth is adequate, but that this strength is obtained to some extent at the expense of the amount of gold used in the completed structure; therefore, the amount of gold necessary, being diminished, all of the strength possible in each and every joint is demanded.

Tenth.—When all of the joints have been thus reinforced and strongly united with not less than 20 karat solder, the fixture should be thoroughly cleaned in the acid bath, and then finished with stones and disks to the point of polishing. The teeth should now be cemented to place, using a cement approximating the color of the tooth, and not attempting to mount more than two with any one mix.

When the cement is thoroughly crystallized, the piece may then be finally polished and mounted.

For those cases in the anterior region where abnormalities of occlusion or elongation of the opposing natural teeth demand *thin facings*, the ordinary type of long pin facings may be used. In their use, however, the best results are to be obtained by previously backing them up separately with thin pure gold, adding wax to this to the desired form, removing the facing, placing graphite points in the holes which receive the pins, and casting. The pins may then be threaded and, when the backings have been assembled with solder, the facings may be cemented to position, thus obtaining all of the previously mentioned advantages of cementation, combined with better form and more uniform strength in the fixture.

In addition to these, for those cases particularly in the lower arch, and in exceedingly “close-bites,” where cosmetics is not a factor, or where the extent of absorption or the elongation of opposing teeth precludes the use of porcelain in any form, the all-gold, cast dummy may be used. Such dummies may be made to conform to the requirements of occlusion, adaptation to gum—if such is required—and contact with the attachments, in wax, and then invested and cast in one piece. This type of “dummy” is useful in supplying the lower second bicuspids and first and second molars, and may include only the occlusal surface, thus forming the so-called “self-cleansing” type of bridge, or the entire tooth with or without a saddle, as the requirements may be. The former type of construction is indicated only where there is an excessive degree of absorption, which will permit of sufficient space between the gum and occlusal surface to insure self-cleansing properties, and wherever this space is not great enough *to be easily kept clean*, direct contact with the gum will afford a more hygienic result. In other words, there should be plenty of space, or none at all.

With these, the problem of attachments and of intermediate

dummies for almost universal application is simplified and systematized.

The remaining feature incident to the construction of all forms of fixed bridgework involves only the proper assemblage of the various parts. While some are casting all attachments and backings with an alloy of five per cent. of platinum and pure gold, and subsequently assembling them with pure gold, thus using no "solder" whatever, still a good grade of 22 karat gold or coin gold may be used with equally good results. When either of the latter is used, the final assemblage may be effected with 22 karat solder, *and providing there is absolute contact between all of the parts to be united* the procedure is thus somewhat facilitated, and the results are uniformly good.

* * * * *

REMOVABLE BRIDGEWORK.

The same general ideas are also applicable to the construction of removable fixtures.

For this class of work, also, three general types of anchorage to the supporting teeth or roots will be found to adequately meet the requirements of the average case. These embrace "clasps," the "telescoping tube and split post," and the various forms of manufactured attachments.

Wide clasps encompassing three angles of the tooth, provided with an occlusal rest, not cast, but made of heavy rolled clasp-metal alloy, probably afford the very best means of obtaining anchorage to the natural or artificial crowns of bicuspid and molars.

That clasps should not be cast is especially emphasized, because the molecular rearrangement resulting from casting most of our present alloys destroys to a greater or less extent the very qualities of strength and resilience demanded of them, and which undoubtedly obtain best in a rolled or drawn metal or alloy.

In all forms of removable bridgework or partial dentures, where clasps are used, however, some form of occlusal rest is necessary as a means of providing against subsequent settlement of the case. If this precaution is not observed, complete loss of occlusion and usefulness will soon follow.

The telescoping tube and split post attachment is useful particularly when confined to the *roots of the six anterior teeth*, or in cases where the tube may be confined within the tooth.

The Roach, Morgan and other types of manufactured attachments will also be found valuable when used in connection with either porcelain or gold crowns or inlays on the cuspids and bicuspid.

In addition to these, I am pleased to show you a method of attachment which, while perhaps but a modification of some of the

previously mentioned types, is entirely new and more or less universally applicable.

This attachment consists in utilizing the grasping principle of an open tube with straight and parallel sides, which is the removable part of the fixture, in combination with a round wire, of about 12 gauge, attached to and therefore a part of the "fixed" portion of the structure, but lying in a horizontal position instead of in a vertical one, in its relation to the supporting fixture.

Such an attachment may be made by utilizing the tube of a "Roach" attachment in combination with 12 gauge clasp metal wire, and while simple and easily constructed is especially useful in extensive cases, where the abutment pieces are assembled, though equally applicable to less extensive, or to the most simple, cases.

It is easily applied, easily tightened when loosened by wear, takes up but little space, does not require absolute parallelism when more than one is used on the same fixture, is applicable alike to either gold or vulcanite work, and is secure.

The conception of this attachment on my part was forced upon me in a very interesting manner. About a year and a half ago I inserted a large fixture in the upper jaw, involving the six anterior teeth and the two third molars, the latter being joined to the former with an iridio-platinum wire, 12 gauge, resting upon the summit of the ridge on each side. In about the centre of the wire on both sides a vertical split post was attached. This constituted the fixed structure, which was cemented to place, the split posts supporting a removable saddle, which supplied the bicusps and molars on each side.

A few weeks after the completion of the case the patient returned with one of these split posts broken away from the fixture, leaving nothing to hold that side in place. At first this seemed a calamity which meant only the destruction and removal of the structure, and the making over of the entire case. As this was not a particularly pleasant procedure to anticipate, and as necessity has always exercised a material influence upon the possible inventive ingenuity of man, it occurred to me that I might obtain attachment to that wire by grasping it with an open cylinder, or tube, lying parallel with it, and thus avoid removing and rebuilding the whole fixture. This I did, with the result that this side worked so well and seemed so much stronger than the one where the vertical split post remained that I subsequently ground it off and used the tube, and the use of this form of attachment in many cases since then has given me more satisfaction than I have ever obtained from any other method.

A similar attachment, known as Gilmore's, is now being manufactured, and may be easily obtained by those who do not care to make it.

When the type or types of attachment thought to be best indicated have been selected, adapted, and completed, the casting process then offers splendid opportunity and great possibilities for the subsequent formation of the body of the fixture, and in this connection I believe that the successful casting of large pieces is only a question of the development of proper technique.

In the construction of cast bases, if a good model of a high grade investment material is obtained, and if the wax base is carefully formed, made sufficiently thin and properly stiffened, the process offers the same assurance of accuracy of adaptation and of strength as previously indicated, and the possibilities are equally unlimited. For all forms and sizes of saddles, or bases, coin gold seems to be especially adapted to cast work, and to afford all of the integral strength ordinarily demanded.

As a final suggestion, permit me to again impress upon you the advantages of simplifying and systematizing your methods, and of casting; the necessity for careful technique and the unlimited possibilities resulting therefrom.

SOCIETY PROCEEDINGS.

THE CANADIAN DENTAL ASSOCIATION AND ONTARIO DENTAL SOCIETY.

THE joint meeting of these societies was held at the Brant House, Burlington, June 3, 4, 5 and 6. The opportunities for social intercourse offered by the holding of the meeting in the hotel, where most of the members were guests, made the meeting from that standpoint particularly a huge success. The facilities for golf, baseball, bowling, etc., were fully taken advantage of, and old friends and classmates had opportunities to recall and live over again the days of the past, that have not hitherto been available at these meetings. A pleasing innovation was the opening of a number of the sessions with musical selections by Hamilton artists. These were greatly appreciated by the members present, if one may judge from the insistent recalls, to which the singers graciously responded.

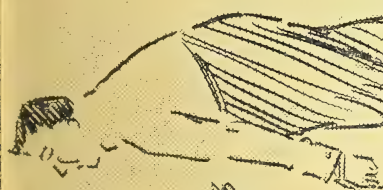
The papers delivered by the invited guests, Drs. Hartzell, Minneapolis; Logan, Chicago, and Goslee, Chicago, were received with enthusiasm. It is seldom that three such excellent papers are provided by guests at one meeting. This, together with the merit of the contributions by members of the societies, Drs. Webster, Grieve, O'Neil, Murray and Rhind, produced a programme second to none.

It is unfortunate that the excellent list of clinics failed to materialize, possibly for unavoidable reasons. Altogether the meeting was a huge success, and the executive and those responsible for

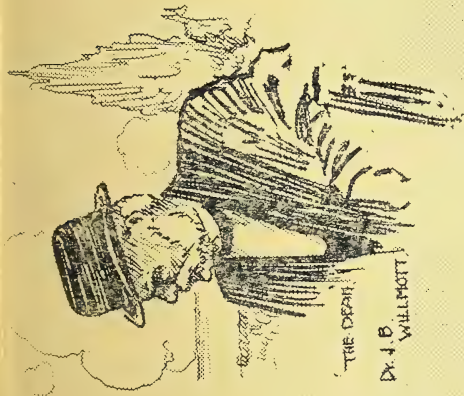
THE LIP!



STRIKE ONE
UMPIRE
DR. W.G. THOMPSON.



CARHER. FOR THE
ALL CANADIAN STARS.
DR. SECOMBE.



THE DREAM!
DR. J.B. WILLMOTT.



THE BIG
SOUTHPAW.
DR. MAX DARNOLD.



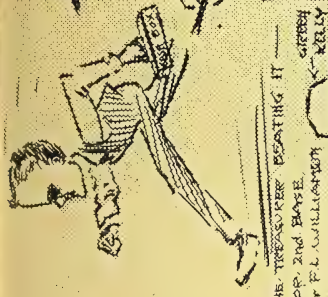
DR. HARTZELL. OF
MINNEAPOLIS



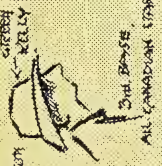
DR. KELLY SLIDES TO THIRD
HAS ANYBODY HERE
SEEN KELLY!!



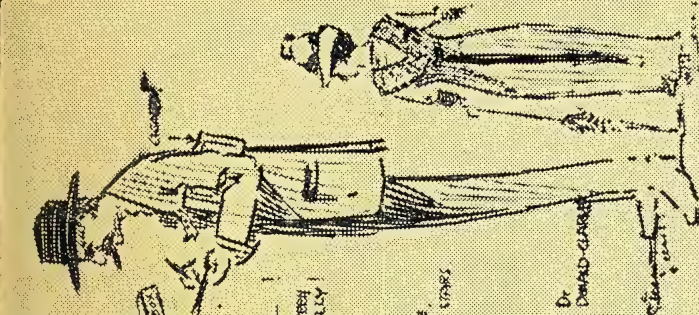
CARHER FOR THE
HIGHER LEAGUES
DR. LOGAN KNAPP



THE TREASURER BEATING IT —
FOR 2ND BASE.
DR. P.L. WILLIAMSON



DR. BOYLE.
ALL CANADIAN STARS.



DR. DONALD CLARK

DR. KELLY'S
BATTING
AVERAGE
1917

the details are to be congratulated. The officers elected were as follows:

ONTARIO DENTAL SOCIETY.

Hon. President.—Dr. W. R. Greene, Ottawa.

President.—Dr. J. A. C. Hoggan, Hamilton.

Vice-President.—Dr. W. C. Davy, Morrisburg.

Secretary.—Dr. W. A. Black, Toronto.

Treasurer.—Dr. F. D. Price, Toronto.

Supervisor of Clinics.—Dr. J. A. Bothwell, Toronto.

Programme Committee.—Dr. F. C. Husband (Convenor), Dr. J. E. Rhind, Dr. A. W. Ellis, Dr. R. G. McLaughlin, Dr. W. E. Willmott.

District Representatives.

District No. 1.—Dr. L. E. Stanley, Ottawa.

District No. 2.—Dr. G. M. Trewin, Bowmanville.

District No. 3.—Dr. A. Day, Toronto.

District No. 4.—Dr. R. H. Cowan, Hamilton.

District No. 5.—Dr. F. E. Bennett, St. Thomas.

District No. 6.—Dr. B. E. Brownlee, Mount Forest.

District No. 7.—Dr. A. E. Santo, London.

Auditors.—Dr. E. Kelly, Dr. F. P. Moore.

Educational Committee.—Dr. W. Secombe (Convenor), Dr. R. J. Reade, Dr. W. H. Doherty, Dr. A. J. McDonagh, Dr. W. C. Trotter.

At the first meeting of the Educational Committee of the Ontario Dental Society, Dr. W. Cecil Trotter was elected Chairman and Dr. R. J. Reade, Secretary.

CANADIAN DENTAL ASSOCIATION.

Hon. President.—Dr. W. D. Cowan, Regina.

President.—Dr. G. F. Bush, Winnipeg.

Vice-President.—Dr. Lauthier, Quebec.

Second Vice-President.—Dr. F. W. Barbour, Fredericton, N.B.

Secretary-Treasurer.—Dr. H. M. Garvin, Winnipeg.

The Executive Committee to be constituted of the foregoing with the following additions: Dr. J. W. Berwick, Montreal; Dr. G. K. Thompson, Halifax; Dr. J. H. Bagnall, Charlottetown; Dr. J. A. C. Hoggan, Hamilton; Dr. G. M. Minogue, Vancouver; Dr. E. M. Doyle, Calgary; Dr. G. A. MacDonald, Yorkton, Sask.

Educational Committee.—The Canadian Oral Prophylactic Association, Limited.

THE CENTRAL ONTARIO DENTAL SOCIETY.

A MEETING of the dentists of York and Ontario Counties was held in the Prince George Hotel, Toronto, on May 17, 1912, when an organization was formed, known as "The Central Ontario Dental Society." The officers elected were: President, Dr. D. C. Smith, Stouffville; Vice-President, Dr. J. W. Barker, Cannington; Secretary-Treasurer, Dr. H. N. Wilkinson, Newmarket.

ORAL HEALTH wishes this new organization abundant success.

ORAL HEALTH.

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ASSOCIATE EDITOR — W. H. DOHERTY, D.D.S., TORONTO, ONT.

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Vol. 2

TORONTO, JULY, 1912.

NO. 7

EDITORIAL.

THE ARMY DENTAL SURGEON.

AT the meeting of the C. D. A. the Army and Navy Committee reported that repeated efforts had been made since the 1910 meeting to have the militia department organize a dental corps along the lines suggested in the September 1911 number of ORAL HEALTH, or failing that, to at least give the dental surgeon on appointment to the army the same rank as that of the medical officer.

At present, the dental surgeons appear in the militia list as supernumeraries attached to the Army Medical Corps, and receive the honorary rank of Captain after three years service.

It is contended by the dental profession, and such contention is supported by members of the medical profession and medical officers in the army, that this state of affairs is undesirable, both from the standpoint of the country's welfare and the dignity of the dental profession.

The committee reported interviews and correspondence with the Hon. Minister of Militia and the Director-General of the Medical Services, who gave the assurance of a careful, personal consideration of any scheme which the C. D. A. might present as an improvement on the present regulations.

It has been stated by the militia department that the formation of a dental corps entirely separate from that of the medical at the present time, would be undesirable, but there does not seem to be any objection to an organization in which the dentist might hold substantive rank with his command limited to his own department. At present the absurd anomaly exists of the dental surgeon, Hon. Capt. Blank, being under the command Lieut. Blank of the Army Medical Corps and receiving orders from and reporting to him.

If the matter could be arranged so that the dental surgeon in the camp or field with substantive rank, while attached to the hospital or field ambulance, would be responsible and report to the P. M. O. instead of to the officer in command of the hospital or field ambulance, it would be an improvement on the present system.

The dissatisfaction among the dental surgeons in the militia regarding the existing regulations has already led to several resignations. This would seem to be an undesirable method of obtaining the recognition we deserve.

In the United States the whole profession united in urging the Government to pass legislation making the dental surgeon a regularly commissioned officer, with a successful result.

The dental profession in Canada seems unanimous with regard to this matter of our status in the army, as evidenced by the adoption at the C. D. A. meeting on June 5th of the following resolutions:

Resolution of Canadian Dental Association re Dental Surgeons in Militia:

Whereas, for several years this Association has been endeavouring to secure substantive rank for the dental surgeon in the Canadian Militia, and no action has been taken by the Department of Militia and Defence towards granting the request.

And whereas, the professional relationship of the dental surgeon to the men of the militia demands that he be given the same rank as that of medical officers.

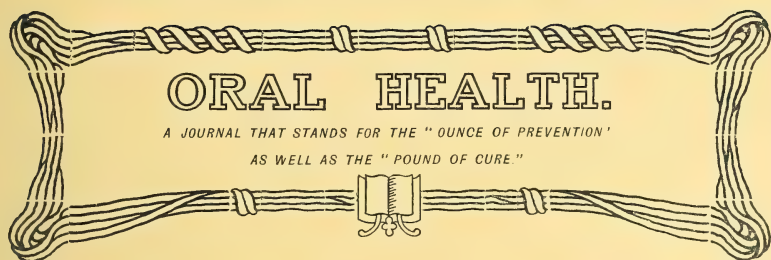
Therefore Resolved, that this Association urge upon the department the importance of appointing the dental surgeon in the same manner and with the same rank as officers of other branches of the service.

Resolution of Canadian Dental Association re Committee on Army and Navy:

Resolved, that a committee be appointed to outline a scheme for organization of a dental corps in the Canadian Militia, such scheme to be submitted to the Minister of Militia.

Since the meeting, the committee has interviewed the Minister of Militia and his Deputy, who with Director-General, now have the whole matter under consideration. There is no doubt that any suggestions from members of the dental profession, if sent to the Director-General of the Medical Services, Ottawa, will receive due consideration.

THE article, in this issue, by Dr. Chas. A. Hodgetts, Medical Advisor to the Commission of Conservation, Ottawa, contains much that is of deep interest to the dental profession. Many of the problems discussed are the same as those confronting the advocates of mouth hygiene as a health measure. The article will be found to be an exceedingly interesting and highly valuable commentary on the problem of child welfare.



Vol. 2

TORONTO, AUGUST, 1912.

No. 8.

DENTAL ECONOMICS.

BY N. S. COYNE, D.D.S.

HOW long will some dentists continue to tell a long-suffering public that their teeth are too soft to be filled with gold—yes, to be filled at all? It seems strange that in this day of advanced thought in dental science some dentists will persist in promulgating this theory. What is the reason? It must be either that they are afraid to give the proper service and charge the proper fee, or the operator lacks ambition and dislikes work.

When a patient presents for treatment is it not the duty of the dentist to give his honest judgment and advice regardless of all things else? Why should a dentist take it for granted that Mrs. Smith doesn't care to spend any money on her teeth? Hence, he tells her they are too soft to be filled with gold and, consequently, "plasters" in a "blob" of cement and dismisses the patient, who goes out into the street spreading the gospel she has just had preached to her, until all her friends and neighbors wonder if they are not similarly situated. Why do so many dentists assume that their patients want cheap services while the very same people are wearing clothes of good quality and substantial price; are living in all other walks of life respectably and honorably, and not "on the cheap"? This is a question I have never yet heard answered.

But why do not dentists who hold this view be frank with their patients, and say: "I know you only want sloppy chunks of 'cement' plastered in your teeth; I know you just want 'silver' stuffed in the holes, with no regard to the preparation of cavi-

ties; I know you only want gold fillings where they show most: I know you don't want any advice about the care of your mouth and teeth and gums; I know you don't want to know how to remove that filthy condition from your mouth, so I'll just patch things up—do it cheap. Of course, this means you'll lose your natural teeth, as well as expose yourself to all manner of diseases, but this matters not. I'll do it cheap; as I believe this is the main consideration in your case!" How many dentists dare take this stand? How many dentists dare make this confession? How many dentists dare tell their patients what they are doing—when they are working cheap? Surely, not one. Why? For fear of losing one's clientele.

But some dentists tell us that to render the very best possible service and the charging of a substantial remuneration fee means the sacrifice of one's patronage. How can both conditions, diametrically opposite, be possible? The thing is absurd. Both conditions cannot exist. One statement must be true and the other false, and it surely doesn't take a man with ordinary business ability long to decide. If dentists are honest with their clientele and with themselves, they'll give the best possible service and charge a fee to correspond, or they will, on the other hand, explain to the patient the value of good dental organs, but confess that while the latter is true, their principle as dentists is to practice cheap, sloppy dentistry at cheap, sloppy fees. In this way the public would not be walking in the dark; they have a chance to choose "good" or "evil," and, needless to say, there's no doubt as to their choice. The public would surely show very much better judgment than many dentists who believe in "cheap dentistry."

It's time dentists stopped talking about hard and soft teeth and got down to business and *prepare* cavities properly and execute their work with precision and honesty. It's time to begin to think about "quality" in dental service, and remember that quality commands a respectable, substantial fee—not fifty cents or one dollar per. Every dentist sees every week of his life the most convincing evidence of patching teeth, and "quick repair" dentistry. Why then wonder at the beggarly dental fees?

How many dentists are there who absolutely refuse to extract teeth or roots that can be rendered healthy and useful? Methinks not many. But is not this the only honest and conscientious course to follow? Dentists are educated to preserve and assist in maintaining in a condition of health the natural dental organs—not to ruthlessly sacrifice teeth simply because an innocent layman requests it. But many dentists say: "If we don't extract teeth when a

patient insists on it the latter will leave the office and employ a man who will." The answer to this flimsy excuse is that the dentist who refuses to extract and explains why has done his duty. If now the patient seeks the services of another who is dishonest enough to extract the offending member, the first man has not this sin of dishonesty to answer for, but the second man has—be he dentist or physician. Of all outrageous, dishonest, unmanly, inhuman practices in dentistry, the unnecessary extraction of teeth is, in the writer's mind, the least pardonable.

But, again, many practitioners argue this way: "It doesn't pay to 'treat' teeth—people don't understand, they don't realize what it means to spend so much time, and the dentist gets so little out of it that in the end he is really out of pocket." In the writer's mind, the dentist who argues this way is as hopelessly inappreciative of the value of dental organs and dental service as the patient whom he fears. There is only money or remuneration in "treating teeth" when the dentist wills it so. Surely, no sane graduate, with scientific training and ordinary intelligence, hopes to "make money" by devitalizing and removing pulp from fine roots (and filling same) of an ordinary molar tooth, completing the whole operation (with an amalgam filling if you will) for \$1.50 or \$2, or even \$3, or yet \$4. If he does entertain such vain hopes, he'll wake up at the end of the year with a balance on the wrong side of his bank account. If the above operation is properly executed, including the scientific preparation of the canals and cavity; and the careful filling of same, not forgetting to polish the amalgam filling as thoroughly as we would polish gold, it cannot be done for less than \$5. And even this should not be a fixed fee, but should be increased if the operation demands it. But, by all means, the quality of the service must be of the highest possible order, and then the fee can be easily collected. The public want honest service and the most for their money.

Surely no one imagines for a minute that such fees cannot be charged without fear of alienating good patients. Honest, competent service, at a good substantial fee, never alienated any good patient. Sloppy, dishonest work, unkept offices, soiled linen, alienate more patients in one week than high fees will drive away in a whole year. This is no fine-spun theory. It is a principle and system that has worked out in practice to the gratification of many dentists that the writer knows personally. It's time to wake up to the call of the public for good, competent dental service, and the latter will be found not only ready, but willing, to pay remunerative fees.

SOME PHASES OF THE ORAL HYGIENE CAMPAIGN.*

By W. H. DOHERTY, D.D.S.

Dental Inspector of the Toronto Public Schools.

Read before the Eastern Ontario Dental Society at Ottawa, May, 1912.

IT is not my object within the limits of this paper to solve the oral hygiene problem. Close acquaintance with this great question has bred instead of the proverbial contempt a very wholesome respect for its magnitude and far-reaching importance. Rather it is my hope that in the discussion of some phases of the question with this society both the members and the writer may approach that clearer view of the situation that must precede any effectual attempts at a solution.

It may seem unnecessary in speaking to a professional body to more than refer to the average mouth conditions among children. I question, however, if anyone who has not actually conducted examinations of a great many mouths just as they are met with during dental inspection has any adequate conception of the actual conditions that exist.

The worst conditions are found among the younger pupils where that popular fallacy that the teeth of the so-called temporary set are of little or no importance, together with the utter neglect resulting from this idea, produce consequences that are a disgrace from a public health standpoint, as well as extremely pitiful from the standpoint of the individual child.

The name "temporary" as applied to the teeth of the first set has been an unfortunate one, leaving as it does the idea not only of lack of permanence but also of lack of importance. The cause of oral hygiene would be materially advanced if this term could be eradicated from our professional vocabulary and from that of the laity. Infinitely better would be some such terms as "First Teeth" and "Second Teeth," which give no impression of a lack of importance of either.

The records of dental inspection in numerous places agree that about 95% of school children are in need of dental attention. The writer, some time ago, conducted an examination of the mouths of children in twelve kindergartens with the idea of finding out just

what conditions were among these younger school children. The results of this examination are as follows:

- 516 pupils examined, age 5—7.
- 90 only who ever claimed to use a tooth brush.
- 128 "six year molars" decayed and 6 lost.
- 2624 cavities in the teeth of the first set.
- 413 teeth of the first set prematurely lost.
- 256 discharging abscesses, an average of one for every second child.
- 206 or just two-fifths able to masticate well.
- 53 entirely without masticating surface.
- 82 mouths only, comparatively clean.
- 222 mouths particularly unclean.
- 42 children with irregular teeth of the second set.
- 22 children only had had dental attention.
- 59 mouths free from decay or 11.4%.

These records were gathered from both the best and the poorest districts in the city and give some idea of the seriousness of mouth conditions among children of kindergarten age.

The actual conditions themselves have to be seen to be appreciated. Accustomed as I have become to uncleanliness in the mouths of school children, an inspection rarely passes that there are not revealed cases of such extreme uncleanliness and disease as to make one wonder that such conditions can be permitted to exist, with in many cases, as a direct result of this mass of infection, a throat blocked by adenoids and enlarged tonsils and a tongue and fetor of breath giving striking evidence of the resultant indigestion and constipation in the intestinal tract.

It is encouraging that the vital relationship between these conditions and the general health is beginning slowly to be recognized. It is perhaps not to be wondered at that their most obvious effect, that of indigestion and intestinal disturbances, should be the first to be commonly appreciated. A gratifying feature in this connection is that it is becoming not at all uncommon at present to have patients present themselves giving a history of digestive disturbances, having themselves been led to suspect mouth conditions as the cause, or having been so advised by the physician.

It is commonly recognized that anything which lowers the vitality for any considerable time may become a predisposing cause to tuberculosis. In this respect the mouth conditions of many children, involving as they do, inability to masticate properly together with the contamination of every mouthful of food by septic matter, stamp them as ready victims of this disease. The number of enlarged lymphatic glands of the neck, in children suffering from de-

cayed and diseased teeth is one of the most serious aspects of this question. The investigations of Dr. Geo. W. Cook, certain German investigators and others, show conclusively that many of these enlarged glands are tuberculous in character and that cavities in decayed teeth, and the open pulp chambers and root canals afford a direct mode of entrance of the tubercle bacillus to the underlying tissues of the jaws and neck, creating a focus of infection in these localities which may later spread to other parts of the body.

The frequency with which the pneumonia germ is found in the mouth has been referred to by a number of observers. Dr. Osler says in this connection that where a patient has had pneumonia special care of the mouth is desirable to avoid a recurrence. This reasoning might well be carried a step further with the conclusion that care of the mouth is an important factor in immunity from this disease.

The writer recently heard a well-known physician state that over 60% of the cases of anemia coming under his observation were due entirely to septic mouth conditions. In fact, as most disease germs enter the body through the mouth, and as cavities in and around diseased and unclean teeth form natural incubators for their development, the best insurance against disease lies in keeping the mouth in a clean and healthy condition.

There is one phase of the question in which the writer has been particularly interested and that is the relation of these conditions of uncleanness and disease in children's mouths, to the so-called "Children's Diseases." Regarding these diseases a recognized work on medicine gives the following information:—

SCARLET FEVER.

Prevalence—Autumn and winter; a remarkable drop in July and August due to closing of schools.

Age—90% of fatal cases under the 10th year. Sucklings rarely attacked.

Seat of infection—Mouth, throat, nose or naso-pharynx.

Complications—Eustachian tube infection and deafness—sub-maxillary lymph glands swollen or suppurating in extreme cases.

Miscellaneous—Germ not isolated. Streptococcus infection plays important part. "Even after the most complete disinfection children who have been removed from the infected house contract the disease upon their return."

MEASLES.

First symptoms in the mouth. "Koplick's Sign," small red spots with bluish white centre. Poison probably in particles of mucous, sputum and secretions of mouth. (Recent investigations

show that the mouth is the last place from which infection is possible.)

MUMPS.

Parotid gland.

WHOPPING COUGH.

Between 1st and 2nd dentitions most frequent from 2 to 7 years.

DIPHTHERIA.

Prevalence—Sucklings rare; most frequently 2 to 5 years.

Associated Bacteria—*Streptococcus pyogenes*, *bacillus coli*, *staphylococcus aureus* and *albus*.

Germs often present in mouths of persons showing no clinical evidence of the disease, the so-called diphtheria carriers.

There are some remarkable facts in connection with these diseases.

They are practically confined to the period between the first and second dentitions, children under two being not commonly attacked.

The seat of infection in every case seems to be in or close to the mouth.

The associated bacteria, such as the *streptococcus* and *staphylococcus aureus* and *albus* are mouth bacteria and found in greater quantities in unclean and diseased mouths.

Add to this list the fact of the generally diseased and unclean condition of children's mouths with the lowered vitality and resistance resulting. We also must recognize the fact that while a healthy mucous membrane is highly resistant, in children's mouths there are many openings through decayed and abscessed teeth direct to the underlying tissues of the mouth.

It is impossible not to draw deductions from these particulars. That these facts are mere coincidences is hard to believe and I am convinced that there is a definite relationship between the prevalence of these diseases and the unclean and diseased state of children's mouths.

The story is told of a boy, a member of the now famous Marion Street School Dental Squad, of Cleveland, who was quarantined when his brother took scarlet fever. The other children of the family one by one contracted the disease until five had taken it and he nursed them all, but himself remained immune. During all this time he took scrupulous care of his mouth.

Dr. Evans, late Health Commissioner of Chicago, states that cavities in diseased teeth retain infection after the period of infec-

tion after every precaution seems to have been taken.

The time will come, when these facts are recognized, that children excluded from school for the infectious diseases will be compelled to have the mouth thoroughly attended to before being permitted to mix with other children.

This recognition that is just beginning to be given to the mouth in its relation to disease and public health is the most hopeful sign that could be wished for by the advocates of mouth hygiene. I am convinced that the ultimate acceptance of mouth hygiene as a prime requisite to good citizenship will not be as a result, as it is sometimes urged, of the recognition of the fact that it would pay financially for school boards to care for pupils' mouths and thus save the expense incidental to retarded mental development, but rather when oral hygiene is accepted in its true proportion as one of the greatest of public health problems. The mouth may be, by its cleanliness and health a barrier at the most likely point of entrance of disease to the body or by its uncleanness and disease both a half-way house for disease germs entering the body and a source of infection to those with whom its possessor comes in contact.

While health authorities are alive to all means of improving the health of the community it is the acute infectious diseases, that from their often fatal nature receive the most attention and in the prevention of which the most stringent laws are enforced. If it can be established to the satisfaction of health authorities that there is a direct relationship between a diseased mouth and both the contraction and spread of the infectious diseases it will mean the solving of the oral hygiene problem. Compulsory cleanliness and dental attention would follow forthwith.

In dealing with the problems of Oral Hygiene as they present themselves at the present time they must be met just as any other health problem is met. Most disease is due to ignorance and in all health campaigns, such as that for reduction of infant mortality, the anti-tuberculosis campaign, etc., it is recognized that the ultimate success depends upon preventive measures becoming universally adopted.

The report of kindergarten conditions earlier in this paper pointed out the almost universal lack of care of the teeth among these children, and the uncleanness and disease resulting. There is what we might almost term an epidemic of tooth decay and associated diseases among school children. To attempt to meet these conditions by the establishment of a clinic, without also going to the root of the matter and eradicating the cause is to court failure at the outset. In a typhoid epidemic every effort is concentrated upon

the discovery of the cause and its removal for it is recognized that otherwise the stamping out of the disease is hopeless. The same reasoning applies to mouth conditions among children. As long as the present ignorance of parents exists and the neglect of any care of mouths of children, natural under the circumstances, the clinic as an institution, while doing undoubted good in individual cases, will never materially change present conditions. It would be a step in the right direction if wherever municipalities are approached for funds for the establishment of dental clinics, the municipal authorities made their grant subject to the school board's making cleanliness of the mouth compulsory.

Compulsory cleanliness of school children's mouths is one of the first steps that should be aimed at. Children are in many instances sent home to clean their boots and rightly so. A child with four to five discharging abscesses upon its face or hands would be looked upon with disfavor by even the most ignorant in health matters and yet children go to school with their mouths a mass of corruption, decay and disease, a menace to themselves and other children and a source of pollution of the air of the schoolroom. Five minutes of a teacher's time each morning, spent in the attempt to see that the mouth has received the same care that most teachers now expect the face, hands and hair to receive, would revolutionize mouth conditions among school children, with all the physical and mental benefits that would result.

Objection is sometimes raised by the teaching profession to their having to assume too many of the responsibilities that rightly belong to parents. There is assuredly no desire to minimize parental responsibility. The present generation of parents however is hopeless. Hundreds and thousands of them may be converted by the gospel of mouth hygiene to a sufficient extent to give their children the benefits of it. If, however, we wait to educate the parents the outlook for the child of the future is not particularly bright. Our hope should be that by educating the children of to-day we educate the parents of the near future and that as a result the children of our present school pupils will receive physical blessings their parents did not receive.

We must look to the teacher then to take a prominent part in promoting mouth health among school children, not only in making cleanliness of the mouth a requirement, but also in teaching the child facts that should be known concerning the teeth and their importance.

It is said that the public school curriculum is overcrowded. If this be so it becomes simply a question of relative values. It would be difficult to argue that there is anything on the curriculum of

greater importance to the child and to the state than the developing of the highest possible physical efficiency.

If the teacher is to recognize the importance of care of the mouth and is to have the requisite knowledge to impart to the pupils, it is necessary that the educational authorities take steps to train teachers to recognize defective mouth conditions as well as other major physical defects. Even where a full medical staff is provided assistance from the teacher is of inestimable value, and it is probable that rural districts and smaller towns will for some considerable time have to depend entirely upon the teacher for any medical and dental inspection. There are many cases where under these circumstances an explanation by teacher to parent of some physical defect in the child would accomplish its removal and so remove a handicap to the child's whole future career.

With the teacher aroused to the importance of mouth health, instruction given the pupils, cleanliness of the mouth made compulsory and parents awakened through suitable literature, we have gone to the root of the difficulty.

It is then that the clinic becomes of real permanent value and not till then. Established without some such preventive measure it is like dealing with a typhoid epidemic by erecting hospitals and leaving the polluted water supply. Even where established in conjunction with such preventive measures it will be found necessary to adopt some definite scheme of treatment, if lasting results are to follow. Indiscriminate work for children whose mouths are in the worst condition will bring about no definite results. Children in pain must be relieved, but outside of these the younger pupils should be examined and given treatment where necessary and those treated the previous term again examined. If time beyond this is available other pupils may receive treatment. In some cases when the amount of work that can be done is limited, it may be wise to concentrate upon the "six year molars" and save as many of these most important teeth as possible. In any event some definite plan should be adopted with a view to permanent results.

It would be a mistake for the profession to rush blindly into the establishment of dental clinics. In the first place as I have pointed out a clinic is of little permanent value unless simply part of a definite plan for improving mouth conditions by the removal of the cause—neglect—and the treatment in a definite manner of disease resulting in spite of all possible care. Again as mouth health is but a phase of public health the profession cannot in justice be loaded, with responsibility for disease which affects probably 95% of school children. It is by every right a state or municipal affair and by these should be dealt with.

But, while we recognize that, as a phase of public health, the question of oral hygiene is a state and municipal matter, there are great responsibilities resting upon the dental profession. It is to the profession that the state must look for the clearing up of the yet obscure points in connection with susceptibility and immunity, both with relation to caries and to pyorrhea. As a scientific body we are responsible for the placing of the prevention of dental disease upon a rational basis.

Great responsibilities nobly met bring corresponding rewards. I have no doubt that the profession to which we are all proud to belong will fully measure up to the opportunities for service to humanity involved in the solving of one of the greatest of public health problems.

THE TECHNIQUE OF IMPRESSION TAKING AND MODEL MAKING.*

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IT may seem to some that I have chosen a strange topic upon which to write a serious paper, yet if one may be permitted to judge by models brought in as a basis for consultation, this surely is a branch of our work in which the vast majority of our profession might profit by instruction. Indeed, it is the one corner of dentistry in which the most slovenliness is exhibited. Slovenliness, demonstrated not alone in the illy-made models, but, what is far more important, slovenliness in the management of the plaster when taking the impression.

Why is it that so many operators use modeling compound? Not 1 per cent. of those who do will argue that modeling compound is better than plaster of Paris for taking impressions where teeth are present in the human mouth. Why, then, do they use it in preference to plaster of Paris? Many will tell you: "It is so much pleasanter, so much cleaner, than plaster of Paris." But they make a mental reservation of the fact that they find it easier to use modeling compound; that, indeed, they do not know how to take impressions with plaster of Paris. Moreover, it is not true that modeling compound is either pleasanter, or cleaner, than plaster of Paris. It is a common experience of orthodontists to have some dental practitioner, or some pseudo-specialist in orthodontia, come in for advice

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in "a regulating case" and present models which really are a disgrace, and calmly remark: "Excuse these models, doctor; I made them in a hurry." Oh! if these gentlemen but knew how sickeningly unoriginal that excuse is, and oh! if they could but be made to comprehend how absolutely inexcusable are these "models made in a hurry"! Why should impressions ever be taken without time in which to do the work properly, and if done properly no "hurry" can excuse the operator from ruining them by producing models that are an abomination to the sight? For this is the fundamental point. No man, woman, or child should be made to submit to the taking of even one set of impressions unnecessarily. Hence, when the operator is in "a hurry" then he should understand that "he has not the time" to take the impressions or make the models.

In Fig. 1 we see nine sets of models, all made by the same man. They are above the average, and the fact that they are above the average is a disgrace to our profession, because they are far below the standard of what they should be. Let me pause a moment to explain why I consider the bad model-making of dentists a disgrace. It is because the work of rearranging the human teeth with its correlated remodelling of the human face is one of the highest arts. The same is true of prosthetic work. Therefore, both the orthodontist and the prosthodontist should be artists, and all their work should be artistic in character. Surely the models used in studying and planning an artist's work should show some evidence of the artistic temperament.

Let me relate an incident to accentuate this. About a year ago a dentist called on me for "advice in a regulating case," as he phrased it over the telephone. At the appointed hour he called, handed me a set of models, and asked: "What would you advise me to do for this patient?" I studied the models for a few moments while he placidly gazed at them with me, and then I said: "If you really have this patient's interest at heart, I would advise you to place her in the hands of an orthodontist." "Why," said the dentist; "do you think that case so difficult?" "No," I replied, "it is rather simple." "Then why do you tell me to send the patient to another man?" And I answered very frankly: "Because you have not even apologized for these awful models. I waited several minutes for you to tell me that you 'made them in a hurry.' But you have offered no excuse whatever. Therefore, I accept them as an index of your artistic standards, and I would be sorry to place any child in your hands for such work."

He went away angry, whereas he should have been grateful to me because I told him the truth, and probably opened his eyes to a deficiency.

Glancing again at the models shown in Fig. 1, I say that they are above the average. They are above the average because it is evident that the gentleman who made them has come within the influence of the art of model-making inaugurated by Dr. Angle, and that he has aimed at the correct standard. The fact that he has not reached it merely indicates that his handicraft is not yet equal to his appreciation of what should be. But we observe that the models are all from plaster impressions; second, that something more than the teeth is shown; third, that some attempt, however, crude, has been made at trimming up the artistic parts of the models. I use the term "artistic" here to differentiate between the anatomical and the other parts of the models. There is one glaring fault to be noted. In several instances broken teeth have been replaced and stuck fast with wax. Nevertheless, if the man who made these models is present to-night I have no doubt that he will produce better results in future.

In Fig. 2 I show you a set of models which, though far from ideal, yet I think compare favorably with those in Fig. 1. Models made in this style will look neat and artistic when placed in a cabinet, and this is an important matter, because the impression made upon a prospective patient's parents, when looking at your collection of models, may have an influence upon getting or losing the case.

TECHNIQUE FOR UPPER IMPRESSIONS.

Let us now consider the details of taking impressions with plaster of Paris. The first essential, of course, is the plaster, and this is often a serious problem. Plaster makers have told me that the working qualities of a barrel of plaster may be materially altered by moving it from the warehouse to the dentist's office on a rainy or even on a damp day. Also that they have never been able absolutely to reproduce a given batch of plaster. With material as sensitive and as variable as this, we have but one recourse, and that is to purchase it in as large a quantity as may be convenient. The advantage of buying a barrel of plaster is that when you do happen to obtain a good working batch you have a plentiful supply. When my office was in a house I always obtained two barrels at a time, keeping them in the cellar. Now that I am in an office building, and have not space for even one barrel, I have obtained my best results by purchasing three cans of plaster at the outset. Then as a can is emptied another is bought. By this means my plaster is kept in my rooms for two or three months before it is used, and this seems to be an advantage, although even now I sometimes am forced to discard a can.

I may say that I use what is known in the trade as "French's

Impression Plaster," which is fairly quick setting, and I use it for both impression and model. I do not add any hastening medium.

In taking an upper impression the first essential is that everything should be in readiness and the patient fully prepared for the work in hand. On the stand I require a glass of water, a finger-bowl, also partly filled with water; two or three orangewood sticks with cotton wrapped about the ends to serve as swabs; and I may say that the cotton swab should not be a great mass of cotton, but should be a small, tightly-wrapped swab. I also have a number of swabs made of Japanese bibulous paper lying loose upon the table. Also a piece of cardboard to receive the pieces of the impression when removed from the mouth; a pair of foil carriers; a pocket knife, with large blade open; a sharp-pointed instrument for searing the plaster, and, lastly, a piece of soft sponge.

By way of preparing the patient I explain in detail what I am about to do and what will be expected of him or her. For example, at one stage of the operation I require both of my hands, and, consequently, the patient must hold the impression tray in place by partly closing the mouth, as we shall see. This is not only explained to the patient, it is rehearsed. The patient is also assured, should she show any anxiety on that point, that no plaster will trickle down her throat; that the chin is to be kept up and the head thrown back; and, with the head in this position, she is asked to try to swallow, whereupon she will discover that she cannot. A properly-fitting tray is selected for the case, and everything is in readiness for the impression.

The plaster for the impression should be sifted into the water and allowed to sink below the surface until the proportion of plaster and water produces the consistency of "double cream." The mouth should be examined to note whether the vault be high or low. If very high, a little plaster should be carried to place in the vault before introducing the tray. The plaster should be placed in the tray cautiously, lest there be an excessive quantity. There should be just enough to fill the deeper parts of the tray, up to, but not higher than, the edge of the rim. Only a very little, if any, should be placed over the high part of the tray—that is, to say, that part which conforms to the vault. A tray thus filled is carefully introduced and gently pressed up, until the teeth are fully submerged in the plaster, but no more. The patient is then asked to close gently, in accordance with the instructions given at the "rehearsal," and to remain at rest as soon as the lower jaw is supporting the tray. This releases the operator's hands. There should be so little plaster in the tray that none is in view; certainly none should escape to soil the face and generally mess things up, as would be the case if an

excess were used. The left corner of the mouth is now lifted up, as seen in the illustration (Fig. 3), and plaster is introduced with a small bone spatula. For this purpose I use a common bone envelope opener. With this plaster in small quantities is placed over the gum in the molar region forward, wasting no time, but never operating in a hurry.

The plaster thus having been placed over the soft tissues in the buccal and labial regions, the head is tipped far back, with chin up. The operator, by stooping slightly, is now enabled to obtain a full view of the region of the soft palate. Placing a finger of each hand so as to support the tray at each corner of the mouth, the tray and plaster are forced upward gently. By this time the plaster, if not mixed too stiff at the outset, will have just begun to set, and as the tray is pressed upward the operator may watch it ooze out beyond the back edge of the tray, and may stop before sufficient escapes to cause any annoyance to the patient. Should the least bit more escape, as may sometimes occur, the operator promptly and delicately removes it with the cotton swab.

We hear a great deal about "nausea" and "gagging" during the taking of impressions, whether with plaster or with modeling compound, and I am positive that this can be more easily prevented when using plaster than when using compound. The reason is that the "gagging" is usually caused by some impingement upon the soft palate. By the technique here described a skillful operator can keep the soft palate clean and free from irritation at all times, whereas when using modeling compound it is practically impossible to prevent the material from extending back and pressing upon the soft palate.

Even when the soft palate is not easily irritated it should be watched and kept free from plaster, as here described, for another reason. The palate may not resent the presence of the excess of plaster of Paris while it is plastic, but it must be remembered that the soft palate is the movable roof of the mouth, and that in the act of swallowing it contracts downward. As soon as the plaster begins to set any saliva trickling into the back of the throat causes the patient to attempt to swallow; the soft palate contracts downward and fractures off the plaster that may lie against it, or beyond the posterior border of the hard palate.

It has already been explained that with the technique described this would be impossible, because no plaster would be lying against the soft palate. Nevertheless, in case this detail of the method should be overlooked and such an emergency should arise the operator should be prepared to meet it with quick action; action fully thought out in advance. As soon as the particle of plaster is dis-

lodged, the patient, becoming anxious not to swallow it, would throw the head forward. This not only prevents the operator from reaching the back of the throat, but actually invites the very disaster that the patient seeks to avoid. If those present will throw the chin well forward upon the chest they will at once discover that it is quite easy to swallow with the head in that position. But if they will throw the head well back, it will be found that the act of swallowing is made most difficult. This should be fully explained during the advance "rehearsal," so that the patient, should any accident occur, will not resist the operator, who must grasp the forehead firmly so as to hold the head back, and, with the other hand, quickly and deftly remove the dislodged piece of plaster with a swab. The best course, however, is to avoid the accident by keeping the back of the throat perfectly clean throughout the entire operation.

Once the impression has been pressed up to place it should be held firmly and immovable. A few minutes must elapse before the plaster will have set hard enough for a removal, and here I may state that the longer the impression can be kept in the mouth and the harder the plaster is allowed to set, the more perfect will be the impression and the resulting model. Indeed, this is the real secret of those well-defined, beautifully-outlined teeth and gum margins that you have so often admired in the cabinets of orthodontists. Their models are better than yours, largely because they allow the impression to remain in the mouth two or three minutes longer than you do.

It is important, therefore, that you keep your patient from becoming restless. To avoid this, keep the patient's mind impressed with the notion that the work is progressing. Keep busy; be doing something all the time. Use a swab and remove any particles of plaster that may break off. Take up the sponge and sponge away bits of plaster that may be about the mouth or face. If there is a free flow of saliva, insert the saliva ejector, and, in addition, mop up the saliva with the paper swabs. But, above all, do something; do anything rather than just hold the tray in place and stand behind the chair, like a wax image, waiting. Remember that waiting is a tiresome occupation.

When the plaster has fully set, as may be tested by that remaining in the cup, the time will have arrived for the removal of the impression. Let me pause here to call your attention to the fact that I said "cup." Never bring one of those abominations, a rubber plaster bowl, into the presence of a patient. A white china cup is much better, much cleaner, and, besides, has a handle.

In removing the impression the first step is to remove the tray. The tray should be grasped firmly, the middle finger resting tightly

against the roof part, and then with a downward and slightly backward pressure, the tray is dislodged, coming away clean and leaving the impression in the mouth, as shown in Fig. 4. Once more an examination should be made to be assured that no loose pieces of plaster may not have broken away, with the possibility of irritating the patient and causing coughing or gagging, just when you desire that she should be most quiet. With the Angle trays, which are the best as yet obtainable, it sometimes occurs that a fracture may occur in the molar region. Occasionally the piece may come away in the tray; but sometimes, though broken away from the main mass, the piece or pieces may remain in place. The molar regions, therefore, should be observed, and such pieces removed first. Next an incision should be made in the plaster in the region of the canine fossa on the left side. I use a right-angled scaling instrument for this purpose, but a sharp hatchet excavator will serve as well. This cut should pass almost entirely through the plaster, care being observed not to pass completely through and wound the soft tissues. Next the wide, thin blade of a pocket knife is forced into this incision, as shown in Fig. 4. The knife is then twisted distally and outwardly, dislodging the buccal fragment. The same method is followed on the right side, the right buccal fragment being removed. The central, or incisal, fragment may then be removed, after which the part in the roof of the mouth may be carefully teased down and out.

As the fragments are removed from the mouth they are placed upon the card on the table. This card is a part of the office system. Upon it the name of the patient is written, and upon it are to be placed first the impression tray and the fragments; next the assembled impression; then the retouched impression; then the varnished impression; then the impression after it is poured, and finally the model itself after separation, and until it is finally finished and placed in the cabinet. Thus at all times this card is a record by which may be known the name of the patient for whom the work is in progress. When there may be a number of patients for whom work is in hand these cards will prove to be a great convenience, as a certain and ready means of identifying work in all its stages. These cards are cut for me about 6 x 8 inches in size.

It is my custom to assemble the impression immediately. Plaster alters its form during the process of setting, and the impression can be more accurately assembled while wet. I prefer also to assemble the fragments in the tray. I therefore take the card containing them immediately to the running water faucet, and here I thoroughly wash the tray itself and the several fragments, special care being taken to remove all loose particles, however tiny, as such pieces prevent the proper adjustment of the fragments. The impression perfectly assembled in the tray may be pressed together so tight

that often all cracks are obliterated. The impression is then swabbed out with the bibulous paper swabs to remove excess of water, and it is finally put away to dry on its card.

TECHNIQUE FOR LOWER IMPRESSION.

The technique for taking a lower impression differs radically from that described for the upper jaw. Here we have new obstacles to meet. The tongue is present, and there is commonly a considerable flow of saliva to be reckoned with.

In speaking of upper impressions, I believe that I omitted to say that the teeth should be thoroughly cleaned and the gums well sprayed in advance. In using the spray it is my practice to direct the spray with one hand, while with the forefinger of the other I gently rub the surface of the gum, thus removing all mucus. This is even more essential when handling the lower, as a good cold spray will at least temporarily retard the flow of saliva.

In the upper jaw it will be remembered that the plaster was placed over the gums after inserting the tray. I recommend exactly the reverse in the lower. In my own office, where I can have the help of an assistant, I proceed as follows: The tray is barely filled with plaster, not overfull, and is placed on the stand in readiness. My assistant then places one finger in the left corner of the mouth and gently holds the cheek away, so that I can have good access to the buccal regions. In illustration, Fig. 5, I show how this can be done working alone. Plaster is introduced with the little bone spatula and laid along the gums from the molars forward to the open and plaster introduced similarly, working from the molars forward to the median line. Then the opposite corner of the mouth is stretched open and plaster introduced similarly, working from the molars toward the incisors, and being cautious to have the plaster flow evenly to avoid imprisoning air and creating airholes.

A common fault with lower impressions is that the lingual surfaces are often imperfect, especially back of the incisors, where too often we detect, when examining a model, that the operator had used his tray in such a manner as to bring the edge of it too close against the lingual gum margin. This may be obviated readily. After covering the buccal and labial surfaces of the gums and teeth with plaster, more plaster should be carried with the spatula along the lingual surfaces. The tray, with its additional proportion of plaster, is then quickly introduced and very gently pressed down against the plaster already in the mouth.

It will be observed that by this method the plaster is introduced against the gums and teeth in a very plastic condition, but that at the moment of pressing the tray to place it will have just begun to

stiffen by setting. Therefore, it is possible to press down the tray without forcing any great quantity of plaster from under the tray, which would thus induce irritation, excessive flow of saliva, and possible gagging. Nevertheless, of course, plaster will escape from under the tray lingually of the incisive region, and also back behind the molars. If this excess of plaster be permitted to remain, it will cause irritation of the parts, inducing an excessive flow of saliva, which, mixing with the plaster, keeps it soft and messy. The tongue also being crowded, will become active, and, by moving about, may wash the plaster away from some of the surfaces. It is, therefore, more imperative in the lower than in the upper, to promptly inaugurate a rapid and thorough cleaning up. First the cotton swab may be used as in the upper jaw, and with a delicacy of touch that plaster may be removed which will be seen to be escaping in the molar region and trickling toward the entrance to the throat. Then the paper swab is taken with foil carriers and the plaster immediately under the tongue is swabbed away, the dry paper picking up the plaster pieces by absorbing its moisture.

We have now reached a period of waiting for the plaster to set, and it is quite important to keep the mind of the patient occupied. There is a psychological fact here of importance. In spite of any expertness that the operator may acquire, there will be a greater quantity of excess plaster when working in the lower than when dealing with the upper jaw. As the plaster hardens small particles are apt to be broken off by the movement of the tongue and cheeks, and these particles irritate and induce excessive flow of saliva. Hence, the operator should keep constantly busied cleaning up. In handling a lower impression I often use up dozens of paper swabs. It will be of advantage also at times to use one or two swabs wet, thus, as it were, washing the parts. This must be quickly followed with dry swabs to soak up the mixture. It may seem to those that have not tried it that we but add to our troubles by introducing more water, but the opposite is true. Indeed, in very wet mouths I frequently introduce the saliva ejector after removing the excess of plaster and then use a cold spray very freely. This cold spray not only materially aids in removing small particles of plaster, but seems to aid in abating the flow of saliva. At all events, one precaution is important. Before attempting to remove the tray, there should be absolutely no plaster in the mouth except that which will be essential to the impression. The mouth and the tray itself should be perfectly clean, with no excess of plaster nor small particles floating about. The tray is then carefully removed, the pressure being upward in the front of the mouth and downward over the molars. The tray is quickly set aside and the mouth again examined, when sometimes it will be found that the removal of the tray

has fractured off small particles of plaster, which should be removed. Sometimes there will be larger pieces broken off between the cheek and buccal gum. These should be taken out and set aside on the waiting record card for replacement when assembling the impression. The impression is removed in the manner described for upper impressions, promptly assembled in the tray, and set aside to dry.

IMPRESSIONS.

I will now take the liberty of showing you a few impressions and making comment thereon:

Fig. 6 is an upper impression, unretouched. It is shown just as it appeared after assembling it in the tray. Please note that the fractures do not show. That is because the parts were assembled and the edges brought together forcibly in the tray, while still wet, and fresh from the mouth.

Fig. 7 is an impression of the lower jaw of the same case, freshly assembled in the tray. I must explain here that my photographer, in painting in black backgrounds for me, mistook my instructions and painted out the handles of the impression trays. In this illustration, however, the edges of the tray are seen at the lingual aspect. This is a somewhat remarkably successful impression, the lingual surfaces back of the incisors and bicuspid being exceedingly perfect. Such a result could only be had where the tongue is quite still and the flow of saliva very slight. The imprint of the tongue is clearly seen, and we note that it was drawn back in the mouth. This has slightly washed the plaster away from the lingual surfaces of the two last molars, which portions of the impression should be restored before pouring.

Fig. 8.—This is an upper impression after it has been somewhat restored by retouching, especially along the back border.

Fig. 9.—This is a retouched lower impression of the same case. It is introduced as being the complete antithesis of the lower previously shown. Here I had to deal with a very active tongue, which could not be kept at rest drawn back. Consequently, I was obliged to remove the excess plaster from under the tongue in order that it might have room to lie at rest extended forward. Nevertheless, by having introduced plaster along the lingual surface prior to placing the tray, and by not forcing the tray down too far, it is observed that a good impression of the lingual surfaces of the teeth and gums has been obtained.

It is often possible in young patients to remove the impression from the mouth without fracture.

Also it is just as easy to use plaster when taking impressions for young children as when working for adults.

I call attention to the method of treating lower impressions by attaching a layer of wax across the lingual surface from one edge to the other. This prevents the plaster of the model when poured from rising up along the edges in the space occupied by the tongue, and facilitates separating and saves much work of trimming up this part of the resulting model.

RETOUCHING IMPRESSIONS.

Even the most skillful operator cannot invariably produce an absolutely perfect and symmetrical impression in all cases. There are many temperaments and many difficulties present in some cases that may be absent in others. Again, the operator is not always at his best. Some days are more trying than others; a man may be ill enough so that really he should be in bed, and yet may be at work because professional duty calls. These and other reasons may cause one occasionally to obtain an impression not so perfect as he may desire. It is manifestly better to repair this, if possible, rather than to cause the patient the annoyance of a second impression. Even a moderately bad impression may be made fairly perfect by skillful retouching.

By retouching is meant the restoration of missing parts of the impression by the additions of plaster. This involves two things—an intimate acquaintance with the appearance of the hard and soft tissues in intaglio, and the ability to restore missing parts of the impression by adding plaster. This adding of the plaster is done with small camel's hair brushes, and the method, I believe, originated with Dr. Norman W. Kingsley.

The requisites are several camel's hair brushes of various sizes, from very small to fairly large, a bowl of fresh water and fresh plaster, preferably of the same quality as that in the impression or model, though this precaution is more important in a model which is to be kept than in an impression, which, of course, will be destroyed. We likewise need one or more saucers.

A little water is poured into the saucer and a small mass of plaster placed just at the edge of the water. The plaster is then mixed in the water with the camel's hair brush and carried with the brush to the impression or model to be retouched. Small air-holes are filled in with the smaller brushes, while large masses may be added, "painted on" layer after layer, with the larger brushes. The model or impression should have dried for at least twenty-four hours for successful retouching, as it is necessary for the dried-out plaster to quickly absorb the moisture of the newly-added masses.

In retouching airholes may be filled in, a fracture obliterated, and the imperfections at the back of the impression and in the molar

regions restored. Note also particularly that plaster can be added outwardly along the buccal borders of the impression. This increases the width of the impression at these parts, and is quite essential to the making of a good model, as will be made clearer when discussing the trimming of the models.

VARNISHING.

It is not easy to explain just how the impression should be varnished. Previous writers have been charged with not stating exact proportions of the alcohol and the varnish. But exact proportions cannot be given, because varnishes differ, and more especially because the evaporation of the alcohol constantly alters the relations. I can only give general directions. After many experiments I find that I obtain my best results by not applying any varnish until the impression has dried for at least one day. I use shellac varnish so thin that the dried surface of the plaster absorbs it rapidly, and I can usually apply two coats of this very thin varnish without "gobbing up" the surface. When this is thoroughly dry, say, in about fifteen minutes, the sandarach varnish is added. This also should be very thin. I apply it with a fairly large brush, well filled, and "flow" it over the parts that overlie the soft tissue—the gum and roof of the mouth.

I do not allow this varnish, however, to flow into the impressions of the teeth, to prevent which I hold the impression upside down, applying the varnish so that it flows away from the teeth parts. The impressions of the teeth are then carefully varnished with a very small brush charged with very little varnish. Watch any professional painter varnishing a door and it will be seen that his brush is never so filled that the varnish trickles from it in all directions. He obtains his best results by lightly coating the parts; repeating if needed. I have three bottles—one for shellac, one for sandarach, and one with plain alcohol, in which the brushes are thoroughly washed after each use. By this means the brushes are always clean and soft, and the same brush can be used for both varnishes.

POURING THE MODELS.

Filling the impression, or pouring the model, as it is usually called, is a simple procedure, and yet it is often imperfectly done. If the previous technique is followed the varnished impression will be at least two days old, and consequently so dry that if the plaster for the model were poured into it, the impression would soak up the moisture from the new plaster, producing a crumbly surface, with much imprisonment of air and consequent airholes. The impression, therefore, should be soaked in water before pouring. This does not mean that it should be saturated. Too much water added at this time will cause the plaster of the impression to so deteriorate that it

will not fracture properly when separating, but will be mushy or chalky in consistency. It should be just wet enough to properly receive the new plaster. It may be set in water for half a minute; not longer.

Dr. Norman W. Kingsley never varnished his impressions at all. His method was to add a little water-color paint (usually red) to the water used in mixing the impression plaster. This gave the impression considerable color, and differentiation between it and the model was easy. Then as a separating medium he would use soap on a shaving brush. This soap should be thoroughly applied and then as thoroughly removed. It is well to allow the water from the faucet to run into the impression, and at the same time brush out all "soap bubbles," thus avoiding airholes. I make use of this medium for separating when treating impressions for working models, which must be poured without delay, except that I no longer color the impression water, as for my working models I use "Sump," an investment compound which contains color. I believe it is much better to use soap as a separating medium when the impression must be poured while it is fresh, rather than to attempt to varnish a "green" impression. As this often results in the varnish peeling off and adhering to the model, in which case it (the varnish) hinders rather than helps the separating. Some recommend the use of soap even in varnished impressions, but, if used at all, it should be used cautiously, as the alkali in the soap will cut the varnish.

In pouring the impression mix the plaster quite thin, almost as thin as milk, and drip it from the end of the spatula in the molar region.

The surface of the impression should be wet enough at the time so that the thin plaster will flow freely into and out of the tooth impressions. Let me say, parenthetically, that I use for mixing plaster knife-shaped spatulas, made of some composition similar to platinoid. Or it may be German silver (whatever that is). At all events, I have discarded the use of steel, because formerly I often noted rust-colored discolorations on my models, which no longer appear, since abandoning the steel knife.

After the plaster has flowed into all the tooth impressions I then tip the impression up so that the plaster will flow away from the tooth parts towards and over the roof, allowing the excess to drip back into the plaster cup (Fig. 10). By this time the plaster will have begun to set, and the operator must work quickly. The impression should be examined; and, while no air should have been imprisoned in the tooth impression, should any such bubbles appear, they should be pricked with a small camel's hair brush and the impression then quickly filled with the setting plaster. At this stage

I use a ferrotype plate, which is a piece of metal, coated with black enamel, used by photographers for mounting prints. Plaster separates from it easily, and it is readily sponged clean. The impression being filled, an additional quantity of plaster is placed on the ferrotype plate, the impression turned over and placed upon this second mass, and the plaster trimmed up to proper shape with the spatula (Fig. 11). There is but one detail of importance to be noted at this point, and that is that sufficient plaster must be added to make the model quite wide at the back corner, as seen in the illustration in which the back part of the poured model is presented. This will be found advantageous when trimming up the models.

SEPARATING THE IMPRESSIONS FROM THE MODEL.

To separate the impression from the model I find it best to allow twenty-four hours to pass when dealing with record models, though working models may be separated as soon as the plaster has sufficiently hardened; often within an hour of pouring.

In dealing with a record model, grooves are cut to facilitate the separation. One groove midway between the margin and the upper surface of the impression, along the buccal and labial surfaces. Another at about the center of the occlusal surfaces of the teeth, and vertical incisions at right angles to these. A section at the posterior part of the buccal area is pried off first. Then a second piece further front, and so on until the entire buccal and labial surfaces of the teeth are disclosed. Then the roof part may be removed, usually entire, in the upper jaw, though it must be taken off in sections in the lower. Pressure should be used so as to press these parts away from, rather than toward, the teeth. Finally, the parts overlying the gum may be pried out, which is usually easy, as these parts were fractured in the original removal of the impression from the mouth.

TRIMMING THE MODELS.

The trimming up of the models is best done at the time of separating, as usually the plaster is then of just the proper consistency to cut with knife, plane, or file. But if for any reason the trimming of the model is delayed, the plaster will harden, and must be made soft again. The model should not be dipped in water. A very little water should be placed in a saucer and the model set in it. The water will be absorbed by capillary attraction, and can be seen to rise as it enters the plaster. As soon as the moisture has reached the region of the gum, the model should be removed from the water, as any excessive wetting will always injure the model.

In trimming up a set of models I first roughly trim the sides in accordance with the well-known angle plan. I then undertake to establish what may be termed a base line. For this purpose I have

adopted a purely dogmatic method, which perhaps has no basis in scientific reasoning, but which serves the purpose well enough. First, I spread a pair of compass points one inch apart. In a very small mouths it may be one-sixteenth of an inch less and in larger mouths one or two-sixteenths more. But most often it is one inch. I place one point of the compass immediately in line with the buccal groove of the first molar, just at the gum margin, and with the other point I make a prick into the plaster. This is done on both sides. Then the compass points are closed one-sixteenth of an inch, and similar marks are made, measuring from the gum line at the center of each cuspid. The object of shortening the measurement in this way is to slightly elevate the base line in the molar region. With a sharp knife these pricks or dots on the plaster are united by cutting a line, and this cut line is continued entirely around the base of the model. The model is then turned bottom side up and the plaster above the line is cut away on a bevel. This renders it easy to cut away the excess plaster without encroaching upon the established base line, but when the base line is almost reached the knife may be discarded for a Stanley plane, a small metal carpenter's plane, shown in several of the illustrations. This is better for the bottom and top of the models than the Angle plane, being wider, though the Angle plane will be more useful along the sides. After planing the base fairly smooth, it should be made smoother still with a coarse file. At this point it is well to repeat the measurement to be sure that the base line has been established properly, as upon this will depend the good appearance of the two models after the upper model has been trimmed to coincide with the established base.

The upper model is now approximately trimmed along the sides and placed in proper occlusion with the lower model. If a previous set of models of the case has been made, these should be taken from the cabinet and the new set made to conform to the first set in height. If it is the first set of models, then a set of models of a similar case may be used as a guide. But in any event, the artistic requirements demand that the top of the models should be at such a height that the part above the gum in the upper model should be sufficient to balance well with the similar part of the lower model.

The desired height of the models having been determined, I use a device presented to me by Dr. Luckey, Jr., of Paterson, for marking the upper line. This device consists of a base and an upright rod, on which a pencil carrier travels, which carrier can be fastened at any desired height with a set screw. With the pencil fastened at any desired height a line is inscribed entirely around the upper model. I find this device very convenient, but in its absence the same result may be obtained with a pair of compasses, one point resting on the table and the other inscribing the mark on the models.

The excess of plaster above this line is then cut away, as was the excess below the base line of the lower model, and the resulting surface is made smooth with plane and file.

The back of the lower model is then trimmed, so as to be at an equal distance from the posterior surface of each molar. The upper model is then again placed in occlusion with the lower, and the back of it is trimmed away and filed so as to conform absolutely and lie in the same vertical plane with the back of the lower model. The two models are held together and the back filled. The posterior corners are then cut away, symmetrically, and both models filed. The side is then cut away so that the anterior terminal of this buccal plane falls in line with the center of the upper cuspid and the front plant extends from this angle to the median line. If possible, the artistic parts of the model should extend sufficiently out beyond the anatomical parts, so that the two models may be held in the hand in occlusion and their sides filed to coincide, without danger of injuring the teeth during the filing (Fig. 12). It is for this purpose that the impressions are built out at the buccal borders, as described in the directions for retouching.

The sides of the models may be squared up so as to rise at right angles from the base by setting the model upon a large glass cube and using the Angle plane, set to cut fine, and handled in such a way that the plane rests partly on the glass and partly against the sides of the model. The sides may then be further perfected by using a very fine file in the same manner. The models we have been working on are seen in Fig. 13.

FINAL FINISHING, RETOUCHING, AND REPAIRING OF MODELS.

Models thus trimmed up as set aside till thoroughly dried. They may then be retouched, as described in relation to treatment of impressions. Airholes may be filled in, missing particles broken from teeth built on, and teeth broken off may be replaced. Two methods of replacing teeth may be described. If the missing part be not lost it may be carefully fitted back into position and so held, while with a sharp bistoury a little of the plaster is cut away along the lingual joint of the break, and this filled in with plaster on the smallest brush. If the part broken off be lost, a small impression of the natural tooth may be taken in Detroit modeling compound, and a new plaster tooth procured in this manner. Then the broken tooth should be cut away from the model, carefully preserving the gum margin. The newly procured plaster tooth should be trimmed up so as to just set in the socket cut in the model, and may be attached to it with the camel's hair brush and fresh plaster.

Should the plaster model show slight imperfections about the

teeth and gums, the model should be immersed in water for about five seconds. This will soften the surface sufficiently to enable the operator to remove any excrescent particles of plaster and perfect the outline of teeth and gums. This is best done with dull instruments. I use a plain, right-angled burnisher. If a polish is desired it may be obtained by dusting talcum powder on the surface of the model while it is slightly moist, and rubbing it in with the finger, dusting off the excess with a brush.

STUDY MODELS AND WORKING MODELS.

Study models are models taken during the progress of the correction of malocclusion, and are made with the purpose of observing the existing conditions better than they can be seen by examination of the mouth itself. Usually some sort of appliance will be in position, which the operator does not desire to remove. The impression is taken with these appliances in place.

By working models I mean models taken with molar bands, or other bands fitted to the teeth, the models being taken with the purpose of soldering other attachments to these bands, as, for example, when molar clamp bands have been fitted and the buccal tubes are to be soldered to them.

The technique of taking these impressions differs considerably from that described for record models. In the record models, as we have seen, we desire to reproduce in the models, not only the teeth, but the gums and vault as well. In study models and working models all that is really required is an accurate reproduction of the teeth, with, of course, a little of the adjacent soft tissues. We may therefore hasten the operation by adding a little salt to the water when mixing the plaster. The plaster itself may be stirred, until a distinct stiffening is felt. This indicates that the setting process has begun and consequently, the impression will be in the mouth but a very short time. Under these circumstances, of course, everything must be in readiness for very rapid work. Very little plaster is placed in the tray—just enough to reach the top of the outer edge of the tray and not quite fill the trough, none at all extending over the vault.

Unlike the method previously described, the tray is carried at once to place. It may surprise some to see how good an impression may be obtained with such a small quantity of plaster.

Where molar clamp bands are in position, even less plaster may be used, as it is not desirable to have much plaster set fast about the lingual screws of the bands. Usually it is best in the molar region to have the plaster only in the deeper part of the tray and up along the buccal sides. In Fig. 14 we see an impression of a lower,

with molar clamp bands placed in the impression. In the molar regions the lingual flanges of the tray were left entirely free of plaster. In the result we see that the plaster did not entirely encompass the lingual screws, thus interfering with removal of the impression; nevertheless, we observe that perfect impressions of the teeth were procured.

Impressions taken for the making of study models should be permitted to harden in the mouth, and are removed in sections just as when making record models. Impressions for working models may be treated in the same manner, but in consequence of the lingual screws of the clamp bands, it is perhaps as well to remove the impression as soon as the plaster remaining in the cup is hard enough to fracture, and with a little gentle rocking the impression may be removed entirely at this stage of the setting.

The separating of the impression from working models is much simpler than when making record models and it may be done usually within thirty minutes of pouring. If the model be poured with Sump, which is of a pinkish color, the procedure is as follows: After removing the tray, the white plaster of the impression is sliced away horizontally with a sharp knife, in thin layers, until the cusps of the teeth just show, the pink of the Sump model rendering this very simple. This may pare off a little of the cusps of the teeth, but that is not of any consequence. The buccal and labial sides of the impression are now very readily pried off, and then the rest of the impression.

A model of this character gives us a reproduction of the teeth with bands in place, and attachments are readily soldered on while still in place on the model. Such models are useful in attaching buccal tubes and fitting the regulating bow at the outset of the case, and also for making retainers at the end of treatment. This method of impression taking and model making is equally applicable to all kinds of prosthetic work, including crown and bridge work.

FLUID FOR STAINING PLAQUES IN PROPHYLAXIS.—Iodin (crystals), grs. 50; iodide potassium, grs. 15; iodide zinc, grs. 15; glycerine, drs. 4; water, drs. 4.

FOR FLOODING POCKETS AFTER SCALING.—Carbolic, 1 part; aconite, 2 parts; tinct. iodine, 3 parts; glycerine, 6 parts.

REPORT OF THE COMMITTEE ON ORTHODONTIC CLASSIFICATION.*

BY NORMAN G. BENNETT, M.B., B.C., L.D.S.

*Read before the British Society for the Study of Orthodontics, and appearing in *The Dental Record*.

THE first of the three great classes consists of cases due to more or less purely local causes. The first five of these are familiar to every one and need not detain us. The sixth (position of crypt) is perhaps not strictly local, inasmuch as it is developmental, but at least the effects are usually restricted to the immediate neighbourhood.

No. 7 is thumb or finger-sucking. It is divided into (a) and (b) to mark the two very distinct results that occur from thumb or finger-sucking, according to the way in which the thumb or fingers are held. We know that when the fingers are sucked more or less in a vertical position, but somewhat sloping backwards and upwards, the result is to push the upper incisors forward and the lower incisors backward. If, on the other hand, the fingers are hooked over the lower incisors, the lower incisors are dragged forwards, the upper incisors are more or less pushed upwards, and the condition of open bite results. In connection with the first variety, in which you have a pushing forward of the upper incisors, with or without a pushing backwards of the lower incisors, I have used two words which are not in the ordinary nomenclature, but they are suggested by Dr. Sim Wallace; and I think they are very good terms to indicate that form of protrusion or retrusion in which the crowns of the teeth are moved, but in which the apices of the roots are in a normal position. The terms are proclination and retroclination.

Then we come to No. 8, premature loss of deciduous or permanent teeth. These have to be divided according to the different teeth that may be lost, (1) deciduous incisors. The loss of deciduous incisors allows contraction of space in front, and produces abnormality of permanent incisors later. The loss of first deciduous molars allows the deciduous canines to be moved slightly backwards, and the second deciduous molars to be moved forwards. So when the time arrives for the first premolar to erupt, it erupts

in the wrong direction. But more important is the loss of the second deciduous molar. Here we get different conditions arising as the result of forward translation of the first permanent molars; that is to say, differences which depend on the order of eruption of the permanent teeth. We know that sometimes the second premolar is the last permanent tooth to erupt and sometimes the canine; and according as that is the case, so the space which has been reduced by the former translation of the molars is taken up by the premolar or the canine, and when the last tooth erupts it has not sufficient space, and erupts with a buccal or lingual inclination. We have used in analogy with the words pro-clination and retro-clination the word inclination, to denote sloping of the tooth with the root in the normal position and the crown in an abnormal situation. When a slight rotation of the upper incisors already exists and the tooth that comes down last is the canine, if the space has been only slightly reduced, and the tooth succeeds in coming down into place, it may slightly increase any abnormality that already exists in the anterior region, whether upper or lower.

With regard to the question of the loss of the first permanent molars, the loss of these before the eruption of the pre-molars leaves the child for a period to bite only with the incisors. The result of that is that the bite closes up; that is to say, the upper teeth are pushed forwards and the lower backwards, and there is a secondary superior pro-clination, and a secondary inferior retro-clination. This condition is never recovered from in the natural manner, because later on, when the premolars erupt, they only erupt so far as the condition of closeness of bite allows; and later on the second molars accommodate themselves to the same condition. With regard to (b), obviously this is a very familiar result of loss of the first permanent molars, a backward movement, or backward sloping or retro-clination, of the premolars. When the loss is on one side there will be a deviation of the centre—the incisors swing round to one side. The abnormal results due to loss of other teeth, permanent incisors and second premolars, we need not be concerned with; but ill results do occur in the position of the third molars.

Now we come to the conditions in which we assume that the child is under-developed, at all events in its jaws. At the age of about seven years the normal spacing between the deciduous incisors does not occur; I am speaking of the cases one sees frequently in which, at six years of age, or five, you may predict with absolute certainty there will be an abnormality in the position of the permanent incisors, because the jaw is not sufficiently developed to make normal room for the permanent incisors; that is to say, we will not put it that the teeth are too large for the jaws, but the jaws are too small

for the teeth. When conditions arise in that way, the most usual result is rotation of the upper incisors, because, the upper incisors being smaller in dimensions labio-lingually than mesio-distally, they can thus erupt when otherwise it would be impossible for them to do so, and so you get a rotation of the central incisors in such a way that, as a rule, the distal surfaces approach one another posteriorly; occasionally the rotation is in the opposite direction; you also get rotation of the lateral incisors in such a way that they overlap the central incisors, or are slightly lingually placed. The details and the varieties are comparatively unimportant; the broad fact is, that owing to abnormal formation of part or the whole, owing to developmental defects of bone, the teeth have not room enough. With regard to the lower incisors, I have used the term imbrication suggested to me to describe overlapping; we know that with the lower incisors the roots more nearly approach a conical form, so that individual rotation of these teeth does not enable them to erupt when they otherwise could not, and they are forced to overlap.

Later we have conditions further developing after the loss of deciduous molars, and here we are considering a part of the jaw which is farther back, that is to say, the part between the lateral incisor and the first molar. The results arising from insufficient development of bone at this time are very similar in appearance to those that arise from forward translation of the first molars. But the Committee considers—and I consider strongly—that even though those conditions appear similar in many cases, and even though, in individual cases, it may be impossible to say what the cause was, it is necessary to distinguish between them. The real cause is fundamental, and of course the methods of treatment must depend on the knowledge—the imperfect knowledge—we possess of the fundamental causes underlying these conditions as they arise. So we have, according to the tooth that erupts last, inclination of the canines or premolars, or a rotation of the upper incisors; I should rather say an increase of the rotation which already exists. Personally, I can hardly think that the force or power of eruption of a canine is sufficient to produce—although some authors say it does produce—a rotation of incisors that are already in a normal position. But of course in these cases, where there is defective growth of bone in the later years, there is usually some rotation of incisors, and the canines erupt into a space that is not sufficient for them, and probably cause some increase in rotation of the incisors. In other conditions you get a U-shaped arch, which consists of an inclination in a lingual direction of the premolars and molars.

Now we come to the third group, which consists of an abnormal relationship between the upper and lower arches and between either arch and the facial contour and correlated abnormal formation of

either arch due to developmental defects of bone. Here we come to conditions that are classified in the Angle classification. Obviously, any abnormal relationship of the arches may be of three prime kinds; that is to say, it may be vertical, antero-posterior, or lateral. Of vertical malocclusions clearly there can be two: open bite and close bite. Close bite, it is true, theoretically speaking, may be of two kinds, that is to say, there may be deficiency of growth in the posterior part of the jaw, or too much growth in the anterior part of the jaw. But the close bite we are mostly concerned with is that in which the development of the back of the jaw, apparently, is insufficient, and the lower incisors bite on the cingula of the upper incisors and push them forwards, that is to say, produce secondary superior pro-clination. And I want to insist here that these cases in which you get a protrusion—to use the generic term—of the incisors, frequently occur with normal occlusion; that they are not in any way necessarily associated with post-normal occlusion of the lower arch; that they may equally well occur, not from this antero-posterior defect, but from the vertical defect of close bite. The opposite condition to that is open bite, in which only molars occlude. We need not go into the cause in classification: it is associated with defective development of bone, with increased obtuseness of the angle, which Mr. Rushton recently referred to in his paper.

Then we come to the great class of antero-posterior defects. I direct your attention, first of all, to the first term after each of these letters: (b) inferior retrusion; (c) superior protrusion; (d) inferior protrusion; (e) superior retrusion; (f) double protrusion; (g) double retrusion. Inferior retrusion is, of course, post-normal occlusion of the lower arch. Superior retrusion is pre-normal occlusion of the upper arch. Taking those two conditions together for a moment, what I want to point out is, that in any particular case I do not think, as a rule, we can say this is a case of inferior retrusion purely, or a case of superior protrusion purely. I think in most cases it is partly one and partly the other. The great majority are inferior retrusion; but for the purposes of classification you must distinguish between the two. The fact that in practice cases share the defects of both conditions does not render the classification wrong from that point of view. The same applies to inferior protrusion and superior retrusion. There again, when the lower teeth bite one unit too far forward, or the upper bite one unit or more too far back, no doubt in most cases it is inferior protrusion that we are concerned with. But of course there are cases in which, although there is a pre-normal occlusion of the lower, or post-normal occlusion of the upper (whichever way we are regarding it for the moment), the position of the mandible as a whole is not too far

advanced in relation to the face, and the real defect is in the upper arch, which is as a whole too far back. There are conditions in which the two arise; there is double protrusion and double retrusion. The latter cases are comparatively rare unless certain teeth are missing.

To go into the sub-headings of these conditions, which attempt to discriminate to some extent, Dr. Sim Wallace thought, and I agree with him, that it is well to distinguish as far as possible between abnormalities in which the teeth are concerned, and abnormalities in which the growth of the bone is concerned. To the teeth we restrict the words pre-placement and post-placement, proclination and retro-clination. To the others we restrict the terms prognathism and retrognathism, terms which for a long time have been used in anthropological writings for conditions of the jaws. To refer briefly to them again, we know that in ordinary typical cases of inferior retrusion the condition is really inferior retrognathism, so at any rate it is a condition in which the development of the lower jaw is defective. It is the defect of the lower jaw as a whole that causes the teeth to bite too far back and to be in post-normal occlusion. There are two divisions of Angle's Class II., in one of which the upper teeth are directed forwards, allowing the lip to pass between; and in the other directed backwards, the lower lip passing in front of the upper incisors to keep them back. They are very different in appearance; but I think the fundamental point is that they both arise from the same condition, that is to say, post-normal occlusion of the lower arch. In the case of superior protrusion, it may conceivably be that the teeth are either tilted forward, or placed too far forward, or the whole upper jaw may be too far forward. We have no means of judging at present of the question whether the maxillæ can be considered in some cases to be too far forward as a whole, that is to say, the bones themselves and not merely the arch. And so in the case of the others. In ordinary cases of inferior protrusion, pre-normal occlusion of the lower arch, there is obviously an inferior prognathism. The lower jaw is not only too far forward, but as a rule it is too large. The same terms are used, and we have made them consistent by using the words prognathism and retrognathism for abnormal jaw formation, and the words pro-clination and retro-clination for tilting teeth. Speaking for a moment in connection with Angle's classification, I wish to say that I think Angle did a very great work in drawing attention to the vast importance of the relationship between the arches. But as a classification, it seems to me that Angle's classification is incomplete and defective. In the first place, it practically takes no account of all minor defects; it is not a classification of abnormalities of position, it is a classification of occlusion pure and simple; and

he classes together all abnormalities that occur in association with normal occlusion. I maintain that many of these abnormalities in which there is a normal occlusion, what is called "crowding" in some books—I consider it a most absurd word—arise from all sorts of causes, and if the classification is to be comprehensive it must attempt to deal with these conditions on an aetiological bases. The other defect of Angle's classification is that it takes little or no account of the relationship of the arches to the face; it only considers them in relation to one another. And he gets over that difficulty in describing treatment by laying down the law that, except in the most extremely rare cases, the first upper molar never departs from its proper position, and that all corrections may be made with regard to that particular tooth. Therefore, to my mind, the treatment that he prescribes must, in certain of the conditions that arise, produce a double protrusion, because I think it can be hardly gainsaid that the upper arch is in some cases too far forward, and that if you correct to that tooth as a fixed point, you must produce results that are inharmonious with the unchangeable area of the face. I think that is as much as I need say, but perhaps other members of the Committee will say something. I have spoken without notes, and I have forgotten some things that I ought to have said; but perhaps other members of the Committee will make good what I have omitted. And if there is any point I can explain I shall be pleased to do so. I hope members present will criticize as freely as they feel disposed.

I.—Abnormal position of one or more teeth due to local causes:—

- (1) Retained deciduous teeth.
- (2) Teeth of abnormal form.
- (3) Supernumeraries.
- (4) Absent teeth.
- (5) Abnormal frænum labii.
- (6) Position of crypt, and total displacement.
- (7) Thumb or finger sucking.
 - Superior pro-clination.
 - Inferior retro-clination.
 - Open bite.
- (8) Premature loss of deciduous or permanent teeth:—
 - Deciduous incisors.
 - Deciduous canines.
 - First deciduous molars.
 - Second deciduous molars, and forward translation of first permanent molars.
 - Buccal or lingual inclination of canines.
 - Buccal or lingual inclination of pre-molars.
 - Rotation of upper incisors.
 - Imbrication of lower incisors.

First permanent molars.

Close bite and secondary superior pro-clination or secondary inferior retro-clination.

Backward translation or retro-clination of pre-molars.

Deviation of centre.

Other permanent teeth.

II.—Abnormal formation of a part of the whole of either arch due to developmental defects of bone.

(1) Conditions first showing themselves while deciduous molars are still in place.

Rotation or post-placement of upper incisors.

Imbrication or fanning of lower incisors.

(2) Conditions arising or further developing after loss of deciduous molars.

Buccal or lingual inclination of canines.

Buccal or lingual inclination of pre-molars.

Accentuation of rotation of upper incisors or of imbrication of lower incisors.

III.—Abnormal relationship between the upper and lower arches, and between either arch and the facial contour, and correlated abnormal formation of either arch due to developmental defects of bone.

(1) Vertical.

Open bite.

Close bite and secondary superior pro-clination.

(2) Antero-posterior (pre-normal or post-normal occlusion of upper or lower arch.)

(a) Normal or sub-normal.

(b) Inferior retrusion.

Inferior retrognathism.

Secondary superior pro-clination, or retro-clination.

(c) Superior protrusion.

Superior dental pre-placement or pro-clination.

Superior prognathism.

(d) Inferior protrusion.

Inferior prognathism.

(e) Superior retrusion.

Superior retrognathism.

(f) Double protrusion.

Superior and inferior dental pre-placement or pro-clination.

Superior and inferior prognathism.

(g) Double retrusion.

Superior and inferior dental post-placement or retro-clination.

Superior and inferior retrognathism.

(3) Lateral.

Labial or lingual occlusion on one side or both.

ON THE DISTRIBUTION OF THE NERVES OF THE DENTAL PULP.

BY J. HOWARD MUMMERY.

(Communicated to the Royal Society by Professor F. Symington,
F.R.S., Received November 6, 1911—Read February 1, 1912.)

THE mode of innervation of the dentine of the human tooth has long been a matter of controversy; while clinical evidence is strongly in favor of a nerve supply to this tissue, the difficulties met with in tracing nerve-fibres in such a difficult substance to examine as the dentine has been a very considerable hindrance to the investigation. It has been very difficult to account for the passage of such very acute sensation from the periphery of the dentine in the absence of nerve-fibres in that situation, and I have long felt, with others, that sensation in the tooth would be found to be conducted by nerve-fibres, as in other tissues of the body. As long ago as 1891 I made preparations which appeared to show that nerve fibres from the pulp entered the dentine, but, by the iron and tannin impregnation process I then employed, could not satisfactorily demonstrate it.

During the last year I have, I think, with several methods of preparation, been successful in making it fully evident that the dentine is richly supplied with nerves from the pulp, which do not terminate, as has been hitherto generally supposed, at the inner margin of the dentine, but enter the tubules of that tissue and traverse them to their peripheral terminations at the enamel and cementum margins.

The bundles of medullated fibres which enter the tooth at the apical foramen traverse the pulp in more or less parallel lines, running in most cases in company with the blood-vessels. They send off numerous side branches, which at the periphery of the pulp lose their medullary sheath, the axis cylinders spreading out into a mass of neurofibrils which enter into a more or less dense plexus beneath the odontoblast layer of cells. From this plexus, known as the plexus of Raschkow, fine neurofibrils pass between and around the odontoblasts, enclosing them in a fine meshwork, and enter into a narrow plexus at the inner margin of the dentine. This has usually been described as the mode of termination of the nerve-fibres of the pulp, but fibres can be seen arising from this plexus, which might

be better termed the "marginal plexus," and passing into the dental tubes.

These neurofibrils pass into the dentine in great abundance and seem to be equally distributed in the coronal portion and considerably below the neck of the tooth, but become more and more scattered as they approach the apex of the root. This is especially well shown by Ramon y Cajal's silver nitrate process. The most successful preparations have been those prepared with silver nitrate and with gold chloride, but the erratic manner in which these substances select the tissues is well known, and it is only here and there among some hundreds of sections that a thoroughly successful impregnation is found.

In this investigation I have made use of fresh calcified teeth ground on a lathe, of teeth decalcified with nitric acid, and with formic acid, and of calcified teeth ground on a stone after impregnation with balsam by the Weil process. This latter method appears to me superior to all others, although a very tedious and troublesome one to carry out successfully; good preparations fully repay the trouble; there appears to be no shrinking of the cells, such as occurs in specimens decalcified with acids, and the matrix of the dentine is not stained. The staining of the matrix in decalcified specimens greatly interferes with the clear observation of the contents of the tubules, the minute longitudinal striation seen in the matrix, especially in silver preparations, giving rise to very deceptive appearances. In a well impregnated balsam the surrounding matrix remaining quite clear and unstained.

I have also procured some very successful slides by staining a small piece of a calcified tooth in bulk with a nuclear stain, passing it through the nitrate of silver process, and then decalcifying with formic acid.

In the substance of the dentine in well-impregnated preparations fine beaded fibres can be traced in the tubules, and in the majority of cases there appear to be two fibres in each tubule which can be traced in many preparations to the inner margins of the enamel and cementum.—(Abstract of the *Proceedings of the Royal Society*, B. Vol. 85).—*The Dental Record*.

ASTRINGENT WASH.—Decoction of red oak bark, 1 part; glycerine, 1 part; alcohol, 1 part. Taste, not pleasant.



This Department is Edited by C. A. KENNEDY, D.D.S.

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

Address. C. A. KENNEDY, D.D.S., 2 College Street, Toronto.

WHAT WOULD RESULT BE?—If all the teachers could be properly equipped to teach, and would teach those entrusted to their care what every boy and girl ought to know of the principles of personal hygiene and preventive medicine, who can estimate the tremendous gain in national efficiency which would result?—*The Public Health Journal*.

POOR TEETH, enlarged tonsils, imperfect functioning of cervical glands—those are the three main causes of physical deficiency in Boston school children. In the examination only 127 showed any evidence of tuberculosis, but there were nearly 3,000 cases of a low physical condition due to insufficient or poor food, to which also may be ascribed some of the 4,550 cases of skin troubles.—*The Public Health Journal*.

TO RECOVER DETACHED PORCELAIN CROWNS.—Throw into a bottle of hydrochloric acid and allow to remain over night; the cement is disintegrated and the post and coping can be easily removed. If the coping fits closely lift away the edge slightly with a sharp pointed instrument. The cement can also be thus removed from gold crowns, doing away with the likelihood of bur punctures.—J. P. Suthringer, *Dental Review*.

MAKING A CLEAN SHELLAC SOLUTION.—To make a clear shellac solution first an ordinary alcoholic solution of shellac is made. A few drops of benzine are added, and the mixture is well shaken. After two or three days the liquid is separated into two distinct layers, the upper alcoholic layer consisting of an entirely clear, dark-red fluid, while the lower represents a mottled mixture of impurities. The clear solution can then be poured or drawn off.—*Dental Digest*, per *Deutsche Zahnärztliche Zeitung*.

CHICAGO BOARD OF EDUCATION AND SEX HYGIENE.—An enlightened step taken in the policy of the public schools in the United States is that which the Chicago Board of Education recently adopted in planning a course of evening instruction for parents on the subject of sex hygiene under the direction of the Rev. Dean Walter T. Sumner, who has worked out the plan, and two other members, fifty public schools will be opened and physicians and lecturers will give not only simple talks on the subject of sex diseases and their consequences, but also there will be practical suggestions as to home instruction upon the general subject of sex.—*Public Health Journal*.

TO MEND BROKEN PLASTER.—Have a jar of sandarach about as thick as cream. Coat the two parts, then hold them in the Bunsen flame, and while the alcohol is burning clamp them together. This is the only method I have ever found that is absolutely certain.—G. E. Hawkins, *Review*.

CLEANING MIRRORS.—Whiting, mixed with alcohol to the consistence of cream, is excellent for polishing mirrors and large surfaces of glass.—*Dental Brief*.

SILVER INLAYS, CAUTIONARY.—Those who are tempted to economize by using silver, pure or alloyed, for cast or matrix inlays will do well to remember that silver is an uncertain metal in the mouth. In some mouths it remains clean and bright for years, apparently without change; in others it corrodes rapidly; silver dentures are occasionally destroyed in six months' time.—*The Dental Brief*.

PROTECTIVE COATING FOR CEMENT FILLINGS.—Melt together equal parts of paraffin wax and resin. This will be found an excellent protection to the cement during its slow hardening.

PUNCTURED RUBBER-DAM.—Should an instrument slip and puncture the rubber-dam, plug the hole with a pellet of cotton and coat it with sandarac and all will be well.

TO CLEAN RUSTY INSTRUMENTS.—Make a saturated solution of Stannous chloride in distilled water. Leave the instruments in this all night. Rinse them in running water and rub dry with chamois.

TO ALTER THE SETTING OF CEMENTS.—A very little finely powdered borax added to the powder of a rapid setting cement will be found to greatly retard its setting. A drop of hydrochloric acid will make a cement set very rapidly.

TO REMOVE PLASTER FROM VULCANITE CASES.—To remove the last traces of plaster from the inside of a vulcanite case, place it for a few minutes in hydrochloric acid. The plaster can then be easily cleaned off with a stiff brush.

HARDENING PLASTER CASTS.—Two or three coats of a saturated solution of borax or alum applied with a brush to the cast; then two additional coats of a hot, saturated solution of barium chloride, following by a rinsing in soapy water. The model is then washed off in water and allowed to dry. Another method of obtaining an exceedingly hard model consists in dipping it in water, to which a small quantity of gum arabic has been added. In this way a highly polished surface is obtained.—J. Schembs, *Province Dentane*.

NITROUS OXIDE AND OXYGEN FOR SENSITIVE CAVITIES.—Young man, about 21 years of age. Mesial cavity in left upper lateral incisor and distal cavity in left upper central incisor. Applied 3 per cent. oxygen with nitrous oxide, including a slight amount of air, through inlet in nose piece. After about a minute's inhalation the line was applied to both cavities without pain. The young man complained of being sick at the stomach, probably induced by fear, and it was thought best not to push the clinic further. The purpose of the clinic was accomplished, showing the painlessness of excavating under nitrous oxide and oxygen in anelgesic stage.—V. H. McAlpin, *The Dental Summary*.

A TEMPORARY SPLINT.—It frequently becomes necessary to open up a pulp chamber or drill into a tooth that is extremely sensitive to the touch, especially in cases of abscesses and pericementitis. In these cases I have found it a very nice way to soften modeling compound and pack it over and around the affected tooth and also one or two of the approximating ones. While the compound is soft with your thumb and index finger squeeze it away from the "sore" tooth and to it adjust a double bow cervical clamp and pack compound well under the bows. After the compound has hardened you can drill into the tooth almost with impunity, as it is held absolutely rigid and secure. Molars are not so easily handled as bicuspids and anteriors.—H. A. Proehl, *Dental Review*.

ERGOT AS A HEMOSTATIC.—One-dram doses of the fluid extract of ergot, diluted in a half tumbler of water and repeated if necessary until a half-ounce or more has been taken. This will be found by far the most satisfactory preparation to use in this connection. It must be remembered, however, that the use of ergot for the purpose of arresting hemorrhages from tooth extraction is positively contra-indicated in females during all stages of pregnancy.—T. O. Heatwole, *Xi-Psi-Phi Quarterly*.

GLASS-STOPPERED BOTTLES FOR VOLATILE SUBSTANCES.—When volatile substances are placed in glass-stoppered bottles the ground portion of the stopper should be moistened with glycerine. This not only makes a more effective seal, but prevents the stopper from sticking.—A. P. Lee, *Dental Brief*.

ORAL HEALTH.

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Vol. 2

TORONTO, AUGUST, 1912.

NO. 8

EDITORIAL.

BETTER TRAINING FOR SCHOOL TEACHERS IN THE RECOGNITION OF COMMON DEFECTS AND DISEASES OF CHILDREN.

AT the last meeting of the Ontario Medical Council the following resolution was submitted and carried:

Whereas, the question of medical inspection of schools and scholars is now prominently before the peoples of various nations;

And, whereas, the Legislature of Ontario in 1907 authorized trustees "to provide for any pay for the dental and medical inspection of pupils as the regulations may prescribe, or, in the absence of regulations as the Board may deem proper."

Resolved, that this Council, in the interests of school children respectfully recommend to the Minister of Education the advisability of taking a physical census of the school children of the Province with the view of comparing the health and physical condition of children in urban and rural districts, and in the meantime, further respectfully recommend the training as in England of the students in our Model Schools, Normal Schools and Faculties of Education, in such knowledge of school hygiene as will enable them to recognize common defects and diseases of children. This Coun-

cil further recognizes that while the employment of school doctors and nurses, giving all their time to medical inspection would be the ideal plan for every municipality in the Province, yet it is of the opinion that the public are not sufficiently familiar with the benefits of medical inspection to be ready to meet the very considerable expense involved in inaugurating such a comprehensive system at the present time.

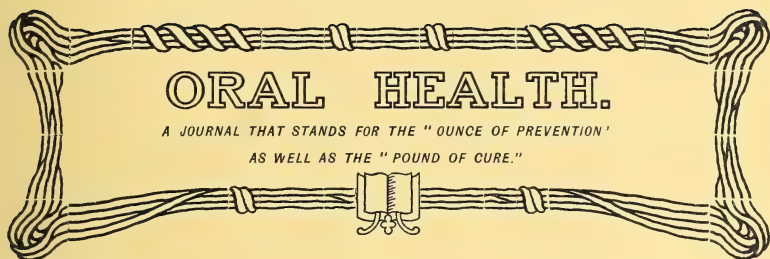
In a previous issue of ORAL HEALTH, editorial mention was made of the serious necessity of some step being taken to make teachers generally more conversant with a few simple facts, concerning the teeth and their relation to health and facial symmetry. There are hundreds of children attending school whose mouths are in such a filthy and diseased condition that they constitute a grave menace to the health of the school population. There is a vast number of children whose features, as a result of loss and irregularity of the teeth, are distorted out of all resemblance to what they ought to be, with the resulting reputation for and development of a weakness of character entirely avoidable.

These conditions are due to a lack of knowledge of their existence, their cause and their serious and pitiful consequences. Universal inspection of school children will take time in being adopted, and in the meantime great good could be accomplished by the training of school teachers to detect the major physical defects. Nor would this involve the "loading up" of the teacher with something outside her sphere as has been sometimes stated. As far as mouth conditions are concerned, if teachers knew nothing but that the teeth of the first set should be preserved and why; that the "six year molars" came at six years and are the most important teeth in the mouth, and why; and that decayed, abscessed teeth and an unclean mouth form one of the greatest sources of infection to the individual and to the public; no intelligent teacher would permit the lack of care of the teeth that is almost universal among the younger school children.

Even with the most efficient medical inspection system an understanding sympathy and co-operation on the part of the teacher is absolutely necessary if the best results are to be readily obtained.

A better understanding of the physical needs of children must be given the teacher. The folly and futility of a system of mental development without proper regard for the physical well being of the child is being more and more recognized.

It is to be hoped, in the interests of the children of the Province, that some steps will be taken by the proper authorities that each child may be assured, in as great a measure as possible, the abundant health upon which its future happiness and good citizenship depend.



Vol. 2 TORONTO, SEPTEMBER, 1912. No. 9.

DECAY OF THE TEETH, ITS CAUSE AND PREVENTION

BY A. A. STEWART, L.D.S., D.D.S.

UNDER the above heading, Bulletin No. 204 has been issued by the Womens Institute Branch of the Ontario Department of Agriculture and is intended as a "follow-up" for Bulletin No. 181 issued by the Department about two years ago.

The material contained in the bulletin was prepared by Dr. Stewart for the Educational Committee of the Ontario Dental Society. The Educational Committee arranged with the Government to publish the article in pamphlet form. 45,000 copies have already been printed for free distribution.

In addition to the Department's regular mailing list five copies are to be sent to each practising dentist in the Province of Ontario. These are for distribution to patients and a further number will be freely supplied any practitioner who makes request to the Department. If the dentists of the Province feel they can use to advantage a greater number of copies, requests should be made before the present edition is exhausted.

Special attention is drawn to the following special announcement appearing in the Bulletin:

The Ontario Dental Society, at its annual meeting in the spring of 1909, appointed an Educational Committee with instructions to launch a campaign with the object of educating the public in the proper care of the teeth and in the means of preventing dental decay. This Committee was continued in office at a subsequent meeting of the Society, and has been organizing educational work throughout the Province by the appointment of local committees in many localities.

The Committee has secured charts, lantern slides and exhibits for use in connection with public lectures and discussions on Oral Hygiene, and will gladly render any possible service to officers of Women's Institutes or other organizations which desire to assist in this work by way of arranging public lectures.

The Ontario Dental Educational Committee will be glad to loan the charts, slides, etc. (without charge), and give any further information or assistance within their power to any organization which desires to take up this work.

As a result of the above announcement, requests have already reached the Educational Committee of the O. D. S. for suggestions as to public lectures, etc., to be given under the auspices of the Women's Institute.

The Government of the Province of Ontario is to be congratulated upon the advanced position it is taking along the lines of public health, not only through its Department of Health, but also through the distribution of literature by the Provincial Department of Agriculture.

The first eleven pages of the Bulletin are reproduced herewith. The remaining pages are made up of copies of certain of the dental charts used by the Board of Education, Toronto, Department of Medical Inspection.

THE Appellate Division of the New York Supreme Court has handed down a decision preventing the disclosure of confidences between dentists and patients, adverse to the recent decision of the Massachusetts Court that the law of privileged communication, as between physician and patient, did not apply to dentists.

Ontario Department of Agriculture

WOMEN'S INSTITUTE BRANCH

Decay of the Teeth

ITS CAUSE AND PREVENTION

A POPULAR impression has long existed that caries, or decay of the teeth, is of comparatively recent origin, and that it is due to an artificial mode of life in a departure from the laws of nature, and to artificial environments. It has been held that our early progenitors knew not the pains of toothache, and retained their dental organs to a late period in life. Actual observa-



Germes of Tooth Decay
(Magnified 1,000 times)

tion has proven this to be untrue, as the study of the skulls of mummies has shown that man in all ages has suffered from the ravages of caries to a greater or less degree. It is a disease which

is as old as the human race, and has probably caused more pain and distress to the human family than any other disease with which man is afflicted.

It would naturally be expected that a condition so universal in its extent, so ancient in its origin, and so distressing in its results, would have been carefully studied and long since understood. The fact really is that until within the last thirty years, or even less, no successful steps were taken toward a study of the cause and prevention of the disease. Much dental work was done, and many good results obtained, but the results obtained were to remedy this evil, rather than to discover the cause, and prevent the decay.

The cause is now definitely known, and much work has been done along remedial lines, and with very good results. It has been demonstrated that dental caries is due to a number of factors, but the principal and basal one is the growth of oral bacteria. The bacteria during their growth produce an acid (lactic acid) which is the destructive agent in the disease.

Bacteria belong to the vegetable kingdom, and are in many respects analogous to the higher plants. They are not, as they are so frequently spoken of, microscopic animals. There are many of them which serve a useful purpose, just as the higher forms of the vegetable kingdom do, and they all should not be looked upon as disease-producing. Only a comparatively few varieties have been studied and classified. A vast number may be looked upon as useless, since investigation has been unable to discover any office, useful or otherwise, which they perform.

In the human mouth, there are many forms of bacteria that are so commonly found that they may be looked upon as being almost indigenous. Among those forms found more or less constantly in the mouth are those which produce lactic acid under favorable conditions, under other conditions they entirely fail to develop. Thus it is seen that for the production of decay we must have conditions prevailing which make the bacteria effective. Those conditions are moisture, a desirable soil, or food in which to develop, and a certain amount of heat. In the mouth we have always present two conditions, moisture and warmth, and in many cases the third.

The various foods, particularly the starches, are, by the ferments of the mouth, changed into forms admirably suited for the growth of these acid-producing bacteria. In the pits of the teeth, or in any irregularities of their surfaces, or between the teeth, food lodges. This provides nourishment for the bacteria, which, in their growth, split up the sugars and starches, building up into their own substances such elements as are necessary for their

growth, and leaving others, and at the same time giving off, or excreting, certain by-products, among which is lactic acid. This acid, which is particularly active in its newly-formed state, attacks the calcic, or lime salts of the tooth. The enamel, being largely composed of these salts, is dissolved, thus causing a large depression. These bacteria, in their development, protect themselves by a gelatinous material which they give off, and by means of which they become attached to the surfaces of the teeth. Under cover of this, the process is continued, lactic acid is constantly formed, and the tooth tissue is gradually dissolved until the central portion of the pulp, commonly called the nerve of the tooth, is reached.

When the disease has reached the pulp, or occasionally before it reaches it, we have a condition known as pulpitis, or ordinary toothache. This is simply an inflammation of the pulp. The usual symptom is severe pain, which is increased by the application of heat or cold, but particularly cold. This may be temporarily relieved by the patient himself simply washing out the cavity with warm water, and applying oil of cloves, creasote, or any anodyne, on a pledget of cotton, and covering it with another piece of cotton. He should see his dentist as soon as possible afterwards.

The next step in this disease of the tooth is the destruction of the pulp itself. The pulp, as a result of these bacteria, becomes disintegrated and putrescent. If any of this material, which is filled with bacteria, passes through the end of the root we have another condition set up. Gases form and cause pressure and irritation, and there is a general inflammation around the end of the root with pus forming. The tooth feels longer than the others, is sore to pressure, great pain is caused by the application of heat, and is relieved by cold. This is commonly spoken of as an abscessed tooth. Relief can only be given in these cases by cleaning out the cavity and opening up the tooth so as to allow the pus to escape. This can be done by the dentist, and a patient will get very little relief until he consults one.

There are many conditions of the tooth and mouth which are secondary causes of decay, enabling the bacteria to produce these disastrous results.

1. The first and most important is the general care taken of the teeth by the individual.

2. The food eaten.

3. The use given the teeth, *i.e.*, people who masticate their food well, and eat food that requires thorough mastication, are less subject to caries.

4. Irregularities of the teeth; teeth that are irregular, and are not in the relation to each other that nature intended them to be, are more susceptible to decay.

5. The general health of the patient; on this depends largely the number and variety of bacteria in the mouth.

6. A hereditary tendency to caries.

THE DENTIST NEEDS THE CO-OPERATION OF THE PATIENT.

We now have the cause of decay briefly defined, and, knowing the cause, what is the remedy?

Many people; too many, leave the care of their teeth entirely in the hands of the dentist, and do not follow closely any of his instructions. Others, and by far the greater number, take absolutely no care of their teeth until they have lost many of them, and are in danger of losing all. They then rush to the dental practitioner, demanding that he save the remaining teeth, a thing which, in many cases, is impossible.

A dentist who has not the co-operation of his patient from the very beginning cannot produce the best possible results. He may do excellent work, but unless the patient assists him, he cannot hope to prevent a recurrence of caries, but simply postpones the time when the teeth will be lost.



Caries in Temporary Molars, by which the Permanent Molars have been affected

ABSOLUTELY CLEAN TEETH DO NOT DECAY.

What can be done? The answer is very simple, and is based on the assertion that an absolutely clean mouth will be absolutely free from caries. As it is impossible, however, to obtain this condition of absolute cleanliness, we have to be satisfied with as near an ap-

proach to it as possible. The degree of cleanliness attained will determine largely the extent to which caries will exist.

In the mouth it is possible to control, in some measure, the rapidity with which bacteria develop. This can be done by antiseptic mouth washes, but only to a limited extent. But one should not depend very largely on this. It can readily be shown that thorough mastication reduces the number of bacteria in the mouth. By the act of vigorous chewing they are brushed off the teeth, and out of their resting places, are mixed with the masticated food, and carried into the stomach to be destroyed by the acid of the gastric juices. After a meal, particularly one which consists of food requiring prolonged mastication, bacteria will be found much less abundant than before the meal. If, however, the mouth is well cleansed, and carefully freed of all food particles immediately after the meal, the increase of bacteria is greatly lessened; and, if the saliva is normal, and the teeth and mucous membrane are in a healthy condition, the development of bacteria will be greatly retarded.

If starchy food, like bread, crackers, etc., is allowed to remain in the mouth, it will greatly assist the development of acid-producing bacteria. The same effect is also produced by saccharine foods, such as sugar, candy, and other sweets. This leads to the conclusion that keeping the mouth clean by frequent and careful removal of food, retards the growth of bacteria, because it reduces the soil in which these microscopic plants develop. When the mouth is free from starchy and saccharine foods, it deprives these acid producers of the elements needed for their growth.

CLEANLINESS OF THE TEETH PREVENTS OTHER DISEASES.

Besides protecting the teeth, such cleanliness reduces the likelihood of acquiring diseases. It is evident that, if disease germs enter a neglected mouth and mucous membrane, where food particles in all stages of decomposition abound, serving as a soil for their development, they will grow in number, and in virulence, much more rapidly than in a clean, well-cared for mouth. A clean mouth is one important safeguard against disease.

It will be naturally suggested that, if decay or caries of the teeth is the result of an acid, why is the remedy not an alkaline mouth wash? Here we are confronted with one of the apparent contradictions in bacteriological study. Acid-producing bacteria develop best in an alkaline medium, and cease to grow when the substance in which they are growing becomes more than one-half of 1 per cent. acid. They are victims of their industry, and are killed by the acid which they produce.

Acid saliva is met with only occasionally, and is not usually accompanied with any marked carious action. Therefore, an alkaline toothwash, useful though such a preparation may be, cannot be looked upon as a much-sought-after agent that will eliminate caries from the catalogue of human ills.

As has been said before, the organisms are attached to the teeth by means of a gelatinous material which they throw out around



Pleasure in Cleaning the Teeth

themselves. They reproduce under this covering, and thus the acid which is formed in the process of their growth is concentrated, and acts very rapidly on the teeth. These gelatinous coverings may be readily removed, but are usually located on a part of the tooth difficult of access. The abrasion of mastication will remove them, unless in a protected part of the tooth. As saliva has the property of penetrating this covering, the bacteria in this way obtain their food.

TEETH SUFFER FROM LACK OF EXPERIENCE.

The teeth suffer in a general way from lack of nutrition and lack of exercise. In addition to this they suffer from lack of surface polish, which would make them more resistant to carious ac-

tion. When it is said that the decay of the teeth is brought about by civilization, it is not intended to assert that caries was unknown among the uncivilized people, for, as has been said previously, caries has been known in all ages. But any observer will gather from a study of skulls of different races, and of different ages, that civilization has a great deal to answer for in regard to caries of the teeth. It is known not only that teeth have deteriorated, but also that there has been a gradual narrowing of the jaw, which is becoming so marked as to cause justifiable alarm. The primary cause which has led to this is lack of use. To produce strong teeth is almost as simple as to produce strong arms—use them. If children could be sent to a chewing school as they are sent to a kindergarten, there would be marked improvement in the race.

There is but little food for the child which affords any exercise for the teeth and the muscles of the jaw; and there is but little advice or encouragement given to children to masticate their food properly. The average meal for the average child is likely to be a



The Result of Neglect in Care of Teeth.
Not healthful nor pretty.

bore, and he hurries through it, washing his food down with water in order to seek a more congenial occupation. It is necessary that children have at each meal some wholesome article of food that calls for vigorous mastication, and the parent should see that the child masticates it properly. If this plan is persisted in, the habit will soon become established and will never be forgotten. Bills for dentistry will be reduced, the child's teeth will become strong and well polished, and there will be distinct enlargement of the jaw and a strengthening of the facial muscles. There can be no exaggeration of the marvellous results achieved by vigorous mastication. It is because uncivilized races live upon food that is tough and but

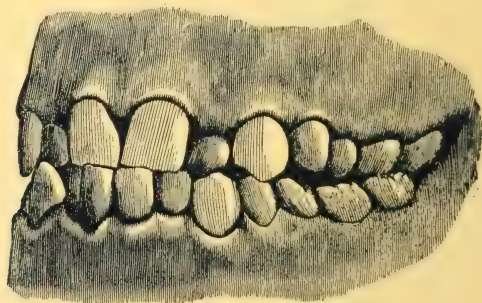
imperfectly cooked, and which requires a great deal of chewing, that they are invariably shown to have excellent teeth, free from irregularities and firmly planted in the jaws, to which are attached strong facial muscles.

It is not the purpose to advocate any particular diet, but merely to call attention to the fact that the presence of teeth in the mouth cries aloud for such a modification of the diet of the child as will produce in them functional activity. Even the temporary teeth must have a goodly amount of exercise, since exercise insures a goodly amount of blood supply, and upon this depends not only their own preservation and usefulness, but also the size and shape of the jaw, and the texture of the permanent teeth which follow. While the jaw is undeveloped and the bones are soft, it is obvious that it is more susceptible to the various influences which affect it than after full development has taken place. And during this period exercise will do much to insure proper development. Even after eruption, permanent teeth are not fully formed. Exercise of the teeth then is necessary to assist in their proper development, which is not complete till several years after their appearance.

In addition to the careful mastication of food and a careful selection of food, the child should be taught to cleanse its mouth just as carefully as it does its hands and face. This habit, once instilled into the child, will always remain. Even at the early age of two years, a child can be taught to use a brush, and before that time the nurse should carefully wash its mouth with a boracic acid solution.

IRREGULARITY OF TEETH AND DECAY.

Irregularities of the teeth have a marked effect on the frequency with which caries occurs in the mouth. All teeth are naturally so



Irregularity of Teeth

shaped that they touch the adjoining teeth at but one point. If the teeth are irregular and in contact over a considerable area of their

surface, a large portion is beyond the reach of a tooth brush, food lodges there, disintegrates and forms an excellent location for the development of bacteria. The cause of these irregularities cannot be considered in detail here, but it is well to emphasize the fact that the premature loss of the temporary teeth is responsible for many irregularities of the permanent ones. This is not the only cause, as thumb-sucking, mouth-breathing, etc., also produce their irregularities, and it is necessary to check these bad habits; but it is more important to properly care for the temporary teeth of the child. Consider the consequences of neglect. The teeth decay, the pulp becomes involved and exposed, causing the child pain and discomfort. It is afraid to masticate its food, and consequently bolts it. Its stomach is overworked, then follows indigestion, intestinal trouble, ending very possibly in undermining the health of the child. In addition to this the jaws and teeth are not being used. As a result, the jaws do not develop, the gums become inflamed and spongy, the teeth more susceptible to decay, with consequent tooth-destruction and death of the pulp, abscesses are formed from which pus exudes into the mouth, and altogether there is a generally unhealthy condition of the mouth which can only act detrimentally to the child.

Realizing the immense benefit which simple food and hygienic methods will bring about, mindful of the truth that mastication will polish the teeth and stimulate healthy nutrition, appreciating the fact that inherited tendencies may be overcome, or their effects minimized by careful attention to the laws of health, still it is recognized that such developments take time, and the fruition of our ambitions cannot be reached in a day. In the meantime, teeth decay, yet how few are willing to give up fifteen minutes of each day to the care of their own or their children's teeth, though it can be shown that such a course would result to a great extent in immunity from caries. As to the number of times a day which it is necessary to cleanse the teeth, no definite statement can be made; this will depend on the shape and regularity of the teeth, the conditions of the secretions, the food eaten, the amount of mastication performed, the care with which brushing is done, and on the frequency of the more thorough polishing by the dentist.

HOW TO BRUSH THE TEETH.

It is self-evident that rapidly decaying teeth require more attention than those which are apparently extremely resistant to caries, and in some cases the frequency with which the teeth are brushed must in a measure be governed by the occupation of the patient. The teeth, if brushed properly, can never be brushed too often, but much injury may be done by unskilled brushing. Using too hard a brush, and too coarse a powder will wear the teeth to an

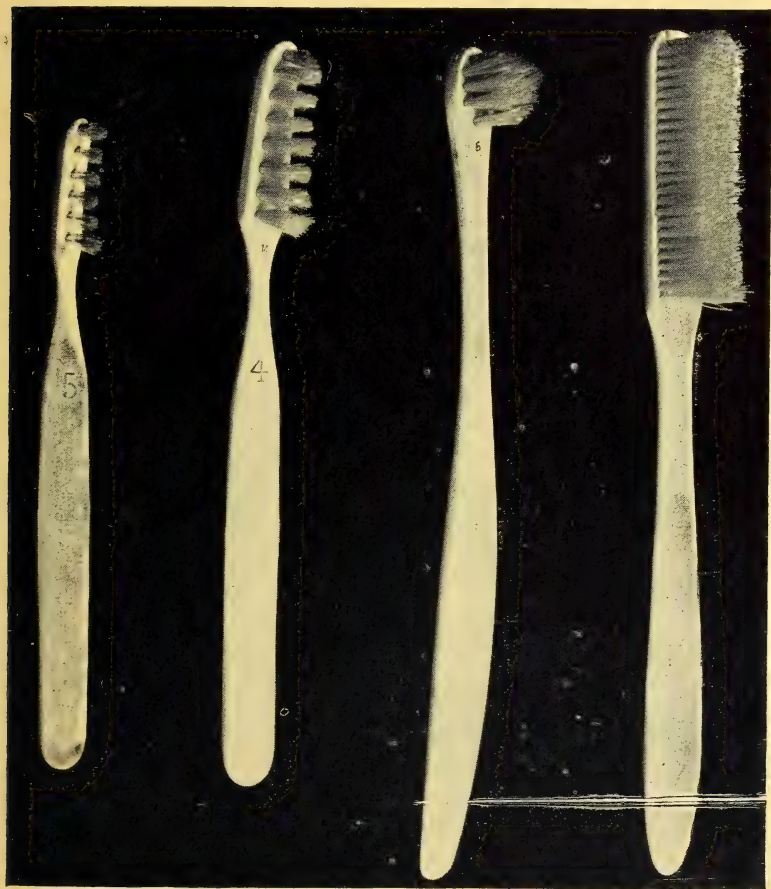
injurious degree. People usually brush their teeth back and forth over those surfaces which are naturally kept clean by the muscular action of the face and lips. They overlook altogether those portions of the teeth where the food lodges and is difficult of access. To reach these places the bristles of the brush should be placed on the gums above the teeth (for the upper teeth) and by turning the wrist the brush is brought down toward the grinding surfaces, the bristles passing into and cleansing the spaces between the teeth. For the lower teeth reverse this order, placing the brush on the gums below the teeth and rotate the handle upward. In this way the gum tissue is not injured but is kept clean and healthy, while with the ordinary method the tissue in these spaces is more or less injured. Laceration of the gums is caused by wooden tooth picks. Silk floss should be *very carefully* used. It is necessary to employ both of these articles at times for the sake of comfort, but only the coarse particles of food can be removed by them, and they play little or no part in the prevention of caries. It may be added that injury to the gum tissue between the teeth, if severe, will eventually lead to its absorption, thus endangering the life of the tooth and rendering it more susceptible to caries.

WHEN TO BRUSH THE TEETH.

Self-respect and a desire for a better feeling in the mouth induces nearly everyone to brush their teeth in the morning; another two minutes may easily be taken after the morning meal for a second brushing, and the business of the day may then be started with a clean mouth and wholesome breath. If it is at all possible, the teeth should be brushed again after lunch, and all should make it an imperative rule that no food should be taken after the teeth have been cleansed for the night. The custom of giving a child a biscuit to eat as it goes to sleep has been productive of great evil. Partial dentures should never be kept in the mouth at night as the adjoining teeth are sure to be attacked by caries. As to the use of mouth washes, tooth pastes and powders, everyone should be governed by the advice of their dentist. There are many mouth preparations on the market; some have virtues, but it is wise to be advised in their selection.

It is the duty of parents to watch the teeth of their children just as carefully as they do their general health. A child should be frequently taken to a dentist who will have the child's interest at heart; the temporary teeth can thus be watched and filled, and so retained as long as nature intended they should. Parents should remember that it is just as important for the health of the child that the temporary teeth be retained in a sound and useful condition until the time of their exfoliation, as it is that the adult's

teeth should be attended to. It is difficult for parents to distinguish between the first permanent molars, which erupt about six years of age, and the temporary teeth. Many of these first permanent molars are lost because of this inability to distinguish, and the child suffers an irreparable loss, for these first molars are really the



From left to right.—The first three are properly made tooth brushes, the first being that for a child. The fourth brush shows kind commonly used, but which is not the best.

most important teeth in the mouth. They serve the important function of preserving the requisite space for the other teeth, their early loss meaning an imperfectly developed arch.

DIET.

The diet of the child should be carefully regulated, and, as soon as the child is of sufficient age to masticate, it should be given meats as well as starchy foods. Proper meats should be chosen—such as good beefsteak—as there is nothing better to give exercise to the teeth and jaws than the mastication of these. This also gives a mixed diet, which is preferable to an entirely carbohydrate or starchy diet. Children should not be given soft bread or soft food of any kind in excess. Give them their starchy food in such a form that they must masticate it. Do not allow them to drink in order to assist mastication.

If the child visits a dentist frequently he soon loses any fear that he may have, and, if the parents follow out the dentist's instructions, the child will soon acquire very good dental habits, and good dental habits will mean better teeth and better facilities for mastication, and this in turn will give the child an opportunity to grow up into a more robust adult than if handicapped with decayed teeth and an unhealthy mouth.

CHOICE OF TOOTH BRUSH.

In choosing a brush for the teeth do not select too large a one, and do not use one from which the bristles come out or break off, for, if they do, and lodge between the teeth, they will cause irritation and injury. A moderately stiff brush is better than one which is too soft. Above all things, use the brush frequently and carefully. Regular polishing by the dentist is necessary to keep the teeth free from all deposits, which in many mouths form very rapidly.

NEED TEETH BE LOST.

With ordinary care from the individual, no teeth need be lost; and, if they are lost, the blame rests entirely upon their owner.

TO PRESERVE THE TEETH.

1. Keep the mouth clean and free from debris.
2. Masticate the food thoroughly.
3. Visit a dentist at regular intervals.
4. Follow his instructions carefully.

SOME POINTS IN THE RECENT PHYSIOLOGY OF THE MOUTH AND TEETH

BY PROFESSOR D. FRASER HARRIS.

Resume of paper and discussion read before the Dental Association of Nova Scotia, July, 1912.

PROFESSOR HARRIS first of all considered the problem of the calcification of the foetal antecedents of the teeth. This may be thus stated: the arterial blood is of uniform composition as regards calcium, yet the dental rudiments and the developing bones absorb calcium in a far higher degree than other living tissues. We must eliminate from this problem the calcification of more or less inert or devitalized tissues such as the cartilages in old age, the walls of inelastic arteries, old caseous deposits, malignant tumors, fat necroses, etc. This absorption of lime is, of course, only part of the general problem, why does one tissue absorb iron, another potassium, another phosphorus and so on?

The chemical factors for the absorption of any one element by any one tissue are (1) affinity-intensity of the tissue for the element, and (2) the amount of the osmotic pressure of the substance in the lymph. Evidently the dental germ has a high affinity for lime, but the cause of this is unknown; it means that chemical differentiation has set in in the protoplasm at a very early date, but again the cause of this is unknown. A study of rickets throws some light on the problem, for, in this disease, though there is plenty of lime in the food and blood, yet it is not absorbed by the developing teeth or bone. In rickets the teeth are imperfectly calcified, are delayed in eruption and decay and fall out earlier than normally. The addition of lime to the food will, therefore, not improve the condition, but recently it has been shown that the administration of thyroid extract improves the condition as regards the bones and the teeth. The theoretical explanation is that the thyroid gland by its internal secretion supplies something after the manner of an amboceptor or link necessary to bind the calcium to the tissues of teeth and bones.

Congenitally deficient power of fixing (metabolising) lime salts seems to be the chemical abnormality in certain children who from

birth are "below par." Such children are slow in developing and backward in teething. Thyroid extra, both with and without lime, has wrought wonders with such unsatisfactory children.

Dr. Harris then spoke of the importance of the activity of the thyroid during pregnancy. The gland is known to enlarge during pregnancy, and it would seem to be devoted to superintending the metabolism of calcium not only in the fetus, but in the mammary gland which deals with large quantities of calcium phosphate in preparation of part of the food of the child as soon as born.

Dr. Harris distinguished softening of the teeth—decalcification—from decay. Micro-organisms which secrete acid substances seem to be responsible for the softening of the inorganic matter of the dentine, so that the microbes of caries have an easier task later on in attacking the organic matter of the dentine.

In the discussion which followed, Dr. Ryan thought that an acid state of the saliva inhibited these acid-secreting micro-organisms; this would be in agreement with the idea that the thiocyanic acid of the saliva is also an antiseptic.

Professor Harris then discussed certain relationships of the nervous system to the teeth and glands of the mouth, for instance, the interesting discovery of Pawlow, of St. Petersburg, that, whereas all sorts of stimuli reflexly called forth submaxillary saliva, only dryness is the stimulus for parotid saliva. An observation of Dr. Ritchie seemed to corroborate this. Emotional states act only on the submaxillary gland and not on the parotid; this shows physiological differentiation in the centre for the glands.

The physiological anatomy of "referred" (sympathetic) pain was gone into, and the possibility of decayed teeth causing temporal neuralgia or headache alluded to.

The flow of saliva in operations on the mouth as a typical reflex was analyzed. The probability of states of mental depression injuriously affecting the teeth was gone into.

The importance of complete mastication of food as initiating a series of events of chemical importance associated with hydrochloric acid was emphasized.

The address concluded with an account of the difficulty of saying of what nerves the nerves of taste were "branches" in the anatomical sense.

THE ANNUAL MEETING OF THE NOVA SCOTIA DENTAL ASSOCIATION

Held at Halifax 11th and 12th July, 1912.

THE annual meeting of the Nova Scotia Dental Association, although not as largely attended this year as usual, was one of the "best ever." The public meeting held on Thursday evening in the Munro Hall of Dalhousie University marked an epoch in the history of the Association. The walls were decorated with charts of the School Dentists Society, and the C. O. P. A. lecture cards. The programme was as follows:

Solo—Mr. Condon, Halifax. Miss Littler, accompanist.

Address of welcome by Mayor Bligh of Halifax.

Responded to by H. W. Black, D.D.S., Sydney.

Solo—Miss Littler, Halifax.

Address—"Ourselves As Others See Us"—A. Stanley MacKenzie, B. A. (Dal.), Ph.D. (J. H. U.), F.R.S.C., President of the University.

Responded to by Hibbert Woodbury, D.D.S.

Paper—"Some Points in the Recent Physiology of the Teeth and Mouth"—D. Fraser Harris, M.B., C.M., M.D. (Glas.), S.Sc. (Lon.), D.Sc. (Birm.), F.R.S.E., Professor of Physiology and Histology in the Dalhousie University.

Discussion—F. W. Ryan, D.D.S., Halifax. S. G. Ritchie, B.A., D.D.S., Halifax.

Solo—Mr. Leo Currie.

The solos by leading singers of Halifax were beautifully rendered and much appreciated.

The welcome of Mayor Bligh, of Halifax, was a masterpiece of eloquence and wit, and the response of Dr. W. H. Black, the President, an admirable one. Dr. Black, by the way, makes an ideal chairman.

The address of Dr. Mackenzie, President of the University, was certainly very flattering to Dean Woodbury and those associated with him in the Maritime Dental College, and disclosed the fact

that the high ideals and standards of that college were great factors in the decision of the Board of Governors to invite the M. D. C. to become a department of Dalhousie University.

Dr. Hibbert Woodbury, President of the Dental Board responded happily, and informed the audience of the work the college and dental association had been doing for the public.

The paper of the evening, by Dr. Fraser Harris, was probably the most scientific and instructive paper on the subject ever read before a dental society.

A resume of the paper and discussion, written for ORAL HEALTH, appears elsewhere in this issue, and will give our readers an idea of its excellence.

Drs. Ryan and Ritchie, in their very able discussion, showed that they were fully aware of recent experiments and discoveries in this connection.

At the business meetings reports from the Dental Board, Dean of the Maritime Dental College, Representative to the Dominion Dental Council, Committee on Dental Education of the Public, were full of interest and showed a large amount of work performed by the various committees.

The most interesting matter to the profession generally was the transfer of the Maritime Dental College to Dalhousie University, which was heartily approved by the association and the sum of \$200 per year for five years voted towards the Dental Faculty for library and equipment.

The Committee on Dental Education of the Public reported progress, and opportunities for work throughout the province. It was reappointed with instructions to prosecute a vigorous campaign throughout the province.

A vote of thanks to the C. O. P. A. for lecture cards and assistance was heartily adopted.

A resolution favoring a union meeting in 1913 with New Brunswick and Prince Edward Island was unanimously passed.

The Dental Board reported the election of the following officers:

President: Dr. Hibbert Woodbury.

Sec'y Registrar: Dr. Geo. K. Thomson.

Treasurer: Dr. A. W. Cogswell.

Executive Committee: Halifax members of the Board.

Preliminary Examiners: Same as those of the Medical Board.

Professional Examiners: Faculty of Dentistry of Dalhousie University and Associate Final Examiners.

The election of officers of the Association resulted as follows:

President: Dr. W. C. Oxner, Halifax.

First Vice-President: Dr. C. H. Craig, Amherst.

Second Vice-President: Dr. F. S. Anderson, Bridgetown.

Secretary: Dr. S. G. Ritchie, Halifax.

Treasurer: Dr. A. H. Cogswell.

Executive Committee: The above officers, with Dr. F. L. Comstock, Berwick.

The clinics held in the crown and bridge room of the Dental College were up to date, and showed that the dentists of Nova Scotia are practicing modern dental surgery.

Dr. A. A. Dill, of Windsor, demonstrated a method of attaching a plate tooth to vulcanite plate where bite is very short, by casting backing and attachment.

Dr. S. G. Ritchie's clinic consisted of casting an aluminum plate with his own casting machine.

Dr. Frank Woodbury showed perfect control of Schoenbach's cement in any temperature by using Ame's liquids with the Schoenbach powder.

Dr. W. C. Oxner used Alexander's plastic gold in making an inlay without casting.

Dr. G. K. Thomson demonstrated the use of duplex gold and tin as a filling material; also the use of the Goslee detachable tooth in crown and bridge work in connection with some original idea of his own.

Representatives of the S. S. White Co. and the Maritime Dental Supply Co. were on hand with large and modern exhibits.

Unfortunately the weather on Friday afternoon was not favorable for the excursion on the harbor, but the members enjoyed a sail up the Northwest Arm, thence to MacNab's Island, where dinner was served, followed by speeches by the President and others. By the way, Black is also an ideal after dinner speaker.

G. K. T.

THE MUSEUM OF THE ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO

THE museum has had a number of additions made to its collection since Dr. Bebb's exhibit during the Canadian Dental Association at Hamilton in June. Yet there must undoubtedly be a larger number of articles in neglected places which, if gathered together, would make a splendid exhibit and add materially to the College Museum.

The recent additions to the museum are as follows:

Extracted teeth—Exostosis, extra large teeth, bifurcated lower bicuspid root, three rooted lower 2nd molars, badly curved roots. Donated by Dr. Edwar W. Paul, Toronto.

Specimen of Bridgework. Donated by Dr. J. A. Bothwell, Toronto.

Three rooted 1st bicuspid and two rooted 2nd bicuspid from same patient, tooth with extremely large piece of salivary calculus attached, fusion of 1st and 2nd molars, good specimen of abrasion in lower molars, good specimen of abrasion in double sets of artificial teeth, large adenoids taken from child 5 years old. Donated by Dr. J. F. Simpson, Trenton, Ont.

Skull of Black Bear, skulls of Mink. Donated by Dr. W. C. Wickett, North Bay, Ont.

An old Richmond automatic gold plugger. Donated by Dr. H. J. Merkley, Winnipeg, Man.

Old dental engine used by Dr. Howard, Dundas. Donated by Dr. E. C. Jones, Dundas, Ont.

Examples of exostosis, examples of root absorption, child's jaw. Donated by Dr. W. C. Gowan, Peterborough, Ont.

Illustration of root absorption under the gum, supernumary lateral. Donated by Dr. C. A. Kennedy, Toronto.

Skulls of animals from Riverdale Zoo, Toronto, skulls from Algonquin Park, Beaver, Rabbit, Skunk, Marten, Muskrat, Squirrel. Donated by Mr. T. W. Gibson, Deputy Minister of Mines, Parliament Buildings, Toronto.

Example of exostosis. Donated by Dr. A. D. A. Mason, Toronto.

A set of old instruments (about A.D. 1850). Donated by Dr. W. C. Davey, Morrisburg, Ont.

Two dentures carved in ivory. Donated by Dr. W. C. Trotter, Toronto.

A plaster model of a Tiger's tooth. Donated by Dr. Wm. Bebb, Los Angeles, California.

OFFICE DECORATION

A DAILY paper asks why it is that dentists' waiting rooms are always furnished in the most depressing manner possible. One particular room belonging to a fashionable dentist is typical of nearly all dentists' waiting rooms. The color scheme is all gold and black—always a depressing mixture.

The walls and ceiling are covered with a heavily embossed paper in shades of dull brown, picked out with gold; the carpet is an old gold axminster (somewhat faded); the chairs of black ebony, with seats of yellow-brown embossed velvet, put in with brass-headed nails—horribly suggestive of funerals. The table and another large piece of furniture (whether for use or ornament is by no means clear) and coal scuttle are of black ebony. Draperies of brocade and velvet in dull gold keep the sun and air from the windows and shroud the fireplace in gloom.

“The ideal waiting-room should be light and bright, furnished with comfortable chairs, plenty of cushions and plenty of flowers. Cheerful pictures should decorate the walls and in addition to the usual current of papers and magazines a small bookcase of light fiction would be much appreciated.

His suggestions for improvement are neither very novel nor very helpful, but it is well to have the layman's impressions.—*The Dental Record*.

BRODIE MEMORIAL

FURTHER contributions to “The Brodie Memorial Fund” are as follows:

Dr. Green	\$1.00
Dr. W. J. Brown	1.00
Dr. Gow	1.00
Dr. F. Williamson	1.00
Dr. Fulton	1.00
Dr. R. McDonald	1.00
Dr. Hoggan	1.00
Dr. Frank Adams	2.00
Dr. Loftus	2.00
Dr. Andrew Bram	1.00
Dr. P. P. Winn	1.00
Dr. Simpson	1.00
Dr. Chambers	1.00
Dr. Rhind	1.00
Dr. Brownlee	1.00
Dr. O. A. Marshall	1.00

IMPLANTING AN ARTIFICIAL ROOT

BY S. H. GUILFORD, D.D.S.

(In this article Dr. Guilford gives a short history of the operation of implantation and outlines a new method of implantation suggested by Dr. E. J. Greenfield of Wichita, Kansas. The article appeared in the June, 1912 issue of the *Garretsonian* and contained a footnote stating that in a letter recently received from Dr. Greenfield the latter stated that artificial roots implanted by him nearly five years ago were still firm and giving good service.)

IMPLANTATION of a natural tooth, once so largely in favor as a means of restoration, has largely fallen into disuse, chiefly on account of its lack of permanency. It had many features to recommend it; for, aside from the naturalness and harmoniousness of the substitute, the method was one that carried with it no injury to adjoining soft or hard tissues, as must ever be the case with plates and bridges.

There were, however, many difficulties and disadvantages associated with the operation which prevented it from coming into very general use.

First, we met with the difficulty of securing a sound tooth with a healthy pericemental membrane attached to it suitable for implanting.

Teeth of this character are rarely extracted under any circumstances, and, therefore, the number to be selected from is necessarily very limited. This fact acted as a deterrent in many cases where otherwise the operation would have been performed.

Second, after implantation, the new tooth had to be firmly secured to adjoining teeth for a long time during bony attachment. While appliances were constructed that would hold it in place, they interfered more or less with proper occlusion and mastication so that the implanted member was not held as immobile as desired owing to occasional contact with opposing teeth.

Third, and most important of all, was the fact that while the implanted tooth was one of nature's products, simply transplanted to a new location under supposedly physiologic conditions and did grow firm in its new environment, *Nature*, after a few years of tolerance, decided that it was essentially foreign in character, and straightway set up processes for its rejection and exclusion. Resorption in all cases slowly followed the act of implantation, so that under the most favorable conditions the operation proved a success for but five or six years. A renewal of the original operation

or its abandonment in favor of a bridge or plate then had to be decided upon, and the choice usually rested with the latter.

There was still another feature associated with implantation which did not seem to militate against it, though it might well have done so, was the insertion of a tooth extracted from the jaw of one person into that of another.

As no history of the tooth or its original possessor could be had, any patient might have objected to the operation through fear of possible infection, in spite of the antiseptic treatment invariably resorted to.

No case of infection has been reported, but the idea of the operation has always seemed somewhat repugnant to an operator of refined tastes.

In spite of these various drawbacks the end in view seemed so desirable to both patient and operator that the operation would have continued to be popular save for its limited durability.

Several attempts have been made to lengthen the life of the operation by changes of method.

The first that the writer recalls was suggested by a practitioner, who proposed that a porcelain tooth and root be made with the root unglazed and having several circular depressions on it into which the new body material would form and help hold it in place.

The next proposition was to insert in the newly-formed socket a silver capsule with indentations on its outer surface. After becoming firm it was designed to cement into the capsule a porcelain crown with rot extension. This operation the writer saw performed at one of the clinics held in connection with the International Dental Congress held in Paris in 1900.

For obvious reasons neither of these methods proved worthy of adoption. More recently, Dr. E. J. Greenfield, of Wichita, Kansas, has proposed a method of implantation which seems more rational and practicable than any heretofore offered.

In brief, it consists of making a shell or capsule from platinum wire of the desired form and size, and inserting this into a prepared socket, to serve as a root or support for an artificial crown.

As the prepared capsule is open or reticulated in character, the presumption is that new bony material will not only surround but penetrate the open spaces and in time solidly fill up the inner portion of the capsule, thus adding materially to its firmness.

The process of forming the alveolus or socket is the same as in the original operation, and to protect the parts from possible infection or ingress of foreign material, a metal cap or cover is sold-

ered to the open end of the artificial root before insertion. This cap is so formed on its outer surface as to admit the attachment of a porcelain crown after the root has become firmly encapsuled. Figures 1, 2, 3 illustrate Dr. Greenfield's method in its various stages. The writer has never yet employed this method, but it appeals to him because it appears to possess the following advantages:

1. As silver has long been used in surgery to approximate and retain portions of fractured bone, and has been retained without undergoing change, there seems no reason why a silver or platinum crib should not in like manner become permanently enclosed in the alveolar process.

2. By having no crown attached to it in the beginning the artificial root if securely wired to the adjoining teeth will not be disturbed by the motions of the jaw while becoming firm.

3. After the capsule has become firm through alveolar attachment, and the operation thus proven successful, the crown can be attached in any manner best suited to the case.

The writer would suggest that instead of the dovetailed slide on the cover of the capsule and the formation of a corresponding dovetail on the root of the crown by which the two parts are eventually connected (as shown in illustrations), that the cap be fitted with the shorter end of a detachable crown post.

This would be much simpler of construction, would provide accommodation for ligating the capsule to adjoining teeth during the time of its becoming firm, and enable a pinless crown or diatoric tooth to be readily attached for the completion of the operation.

If the newly formed socket is made of just sufficient size to grasp the capsule firmly after its introduction, and both socket and capsule are antiseptically treated, there would seem to be no more danger of accidental infection during or subsequent to the operation than in the case of a natural root implantation, and we have yet to hear of any ill results of this character following the numerous implantations of the past years.



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ORAL PROPHYLAXIS

BY F. H. SKINNER, D.D.S., CHICAGO, ILL.

Read before the South Dakota Dental Society.

THE principles, technique, practice and benefits derived from oral prophylaxis have been so thoroughly circulated through the medium of lectures, dental journals, and heart-to-heart talks among dentists, that the possibility of bringing any new thought to you at this time is very remote, so that the only excuse for choosing this subject is the comparatively limited number of the laity who are deriving any benefit from it, and the very small army of practitioners who are really putting it into practice in their everyday work.

Three things are absolutely necessary to make oral prophylaxis a success. First, the dentists must *know the benefits* to be derived from regular systematic prophylactic work; second, he must have the faculty of impressing his patients with that knowledge; third, he must have the ability to demonstrate to them that, with their help, he can get results.

In the *Dental Cosmos* of April, 1910, is a very instructive paper on "Dental Caries," by Dr. L. M. Waugh, of Buffalo, N.Y., and I take the liberty of quoting a part of it to you.

Speaking of dental caries, Dr. Waugh says:

"The general predisposing causes may be divided into—heredity. Pre-natal and post-natal influences. Age. Bodily conditions.

"The fact that caries is much more prevalent in some mouths than in others, and that there are periods of comparative immunity and marked susceptibility have led to much speculation as to the cause.

"Formerly, it was generally thought that so-called hard and soft tooth-structure was primarily responsible for periods of slow and rapid progress. Dr. Black, in 1893, made known the results of analyses of 'hard' and 'soft' teeth, which led him to the opinion that hardness and softness have nothing to do with the inception of caries. Clinical observation would seem to bear this out. It is noticeable in mouths with teeth having enamel of poor texture, and yielding easily to the chisel, that but little decay is present, and again

that in mouths containing teeth with dense enamel there is evidence of much caries.

“These facts led Dr. Black to the conclusion that a period of marked tooth decay is due to either a temporary lack of oral hygiene, the exciting cause, bacteria, being active, or to some systematic condition which so changes the constitution of the oral fluids as to favor the formation of microbial plaques.

“It will here be noticed that in either case the problem is a bacteriological one. The micro-organisms, to cause decalcification, must be in contact with the tooth, and pour their acid by-product directly on its surface. For this there must be some means by which the micro-organisms can be retained in contact with the tooth surfaces, especially if these be smooth. The bacteria, under conditions which interfere with or restrain their growth, form a substance commonly spoken of as gelatinoid: invested with this substance they attach themselves to the tooth surface. This mass is termed the microbial plaque.”

Your essayist believes, however, that calcium salts also play an important part in the prevention of dental caries, for in mouths where there is an excess of calcium salts we find all kinds of fermentation taking place, and yet little or no caries. If of the light-colored variety, commonly called salivary, it collects in large quantities and gradually, by pressure, forces the soft as well as the bony structure from the teeth. This variety is easily removed, as it seldom works under the gums.

The dark-colored, or so-called “serumal” variety, is deposited usually just under the free margin, and any external friction, and even just the movement of the teeth in the alveolus, abrades the inner border of the gingivus just as much as if a strip of sandpaper were allowed to remain around the neck of the tooth, thus making an ideal entrance for infection, and unless the tissues are immune to pus-producing bacteria, the gums become red, swollen and congested, suppuration starts, and the alveolar process will be gradually destroyed.

The local and systematic pathological conditions which lead up to the loss of the dental organs have never been settled, so that the results of one investigator's work have never been disputed by another standing equally high in the profession. But I think it is universally admitted that neither pyorrhea nor decay is found where surfaces have always been kept smooth, polished and clean; that all decay is the result of by-products of bacteria from these “microbial plaques,” which are nothing more nor less than fermenting liquefied food-products held in a glutinous mass on the teeth, in places where

Nature has left a defect in development, or on surfaces favorable to the lodgment of food, where attrition and the combined action of the tongue, cheeks and lips do not remove it, and this mass of plaques (or scales) can only be removed by friction, and if of long standing, or on a surface which has already become etched from successive attacks, it requires *something more than the friction of a toothbrush to remove it.*

Liquefied food products osmose through microbial plaques, and under their protection are acted upon by acid-producing bacteria, forming (supposedly) lactic acid, which unites with the calcium salts from the enamel, forming calcium lactate, which, when formed, passes out again, making room for a fresh supply of liquefied starches and sugars, to be again converted into acid and call forth a little more of the calcium salts, which can never be replaced in the tooth.

These deposits are most likely to gather just gingivally of the contact point, on the gingival third close to the gum line; and in the fissures or in depressions of malformed teeth. If sulpho-cyanite of potassium, or possibly other allied salts, be present in the saliva, it is claimed by some that these gelatinoid plaques do not form, and the person so favored is immune to decay until there is a change in the chemical constituents of the saliva.

If, as the debris gathers, there is a sufficient quantity of calcium salt to neutralize any quantity of acid formed, no decay will take place, but a crust will gradually form around the necks of the teeth and work rootwise, which, if allowed to remain, will usually result in pyorrhea because of abrasion, lowered vital resistance of the parts and infection.

SERUMAL CALCULUS.

Just how this crust of so-called serumal deposit forms is a disputed question. One authority claims it is a deposit from the residue of the breaking down alveolar process; another says it is deposited from the blood and serum, which is constantly oozing from tissue in certain stages of inflammation, or from free ends of small blood vessels which formerly supplied the lost tissue; while another claims that through infection, bruising, or traumatic causes, the circulation of the pericementum is impaired and the serumal calculus is gradually deposited as a result. This usually takes place just under the free margin of the gums. No matter which theory is correct, the duty of the dental operator is to recognize and remove all foreign substance. It is generally observed by men working along this line that where calcium salts gathers in abundance decay is absent, or nearly so, as upon the lingual surfaces of lower incisors, for

example; and where decay goes on rapidly, calcium salts are absent. The rougher the surfaces of the teeth the harder it is to remove any foreign substance.

CARE OF TEETH IN CHILDHOOD.

It is the essayist's belief that the foundation for most dental trouble is laid in childhood. During the growing period it is hard to get the little folks to take proper care of their teeth; soft accumulations are left to ferment, and if cavities do not actually take place, the victim enters maturity with the gingival third of the enamel roughened and etched, and the foundation for trouble is laid before he begins to take personal pride enough to care for appearances, or to realize the value of a good set of teeth. About the age of maturity the calcium salts, which have been used to build up bone tissue, are not needed in such large quantities by the system, and are thrown out by the eliminating organs.

The saliva takes its share, and as it comes in contact with free ammonia, which is always present in the alimentary canal (especially if there is faulty metabolism or intestinal indigestion), the calcium salts precipitate and lodge on the first hard substance met, usually the teeth.

This process is going on twenty-four hours a day, seven days a week and fifty-two weeks a year, and the catastrophe of dentistry is that a great deal of harm is usually done before the prospective patient realizes there is even any danger.

Again quoting from Dr. Waugh's paper: "If the tooth is kept clean and free from bacteria, *dental caries cannot exist*. These facts, when first discovered, gave an enormous impetus to preventive dentistry. This by-product being an acid, it was at first thought that antacid mouthwashes would largely limit, if not control, the disease. This, however, proved of little value, as it was shown that acid will appear in the mouth twenty minutes after a meal, and after the mouth fluid has been neutralized by a saturated solution of sodium bicarbonate.

"The germicides, disinfectants and antiseptics were also enthusiastically employed, and great varieties of so-called mouth-washes were soon foisted upon the profession, but they, too, have proved inadequate, as any agent sufficiently strong to sterilize the mouth would result in serious injury to the soft tissues."

This leads us to the belief that the only effective means of preventing these dental pathological conditions lies in the mechanical removal of all foreign substances and maintaining absolute cleanliness, which brings us to the subject of oral prophylaxis.

PREVENTIVE TREATMENT FOR CHILDREN.

This branch of dentistry, to be ideal, should start with the eruption of the temporary teeth. As the teeth erupt, both temporary and permanent, the fissures of molars and bicuspidis should be covered with cement and kept protected until maturity, or thereafter, if necessary. The technique of this procedure is as follows: Place a cotton roll on each side of the tooth to be covered. Have the mother, nurse or your assistant help hold these in place; then, drying the tooth with compressed air or chip blower, wipe off with alcohol and dry again; mix cement to about the consistency used in crown and bridge work, and cover occlusal surfaces with cement; then press to place with finger well vaselined, which will prevent cement from sticking to finger. Pressure should squeeze out everything except that which is held in the fissures. It will interfere in no way with the interlocking of cusps or with the articulation, but will prevent decay in fissures wherever it adheres. The copper cements probably have more adhesive property than the lighter colored, but are somewhat objectionable on account of their color. The deeper the fissure, the more liable to decay, but if covered before decalcification begins, the longer cement will last in it because of its depth. This may require renewing from every one to five years, but it will surely prevent decay of fissures, which is three-fourths of the battle with juvenile patients.

STAIN FOR MICROBIC PLAQUES.

Microbic plaques and small granules of calcific deposits are transparent, or so nearly the color of the teeth that they are frequently invisible to the eye. The sense of touch, after months of experience with a hand polisher or orange-wood stick, will only imperfectly indicate to us whether or not a surface is clean, so that the only way we have of absolutely proving whether all foreign substance is removed is by the use of a staining or discoloring solution.

The following formula has proven very satisfactory to those who have given it a trial:

Iodine crystals	Grs. 50
Potassium Iodide	Grs. 15
Zinc Iodide	Grs. 15
Glycerine	Drs. 4
Aqua	Drs. 4
Mix. Put up in glass stoper bottle.	
Sig.: Use for disclosing solution.	

This is an aqueous solution of iodine which, while it is slightly astringent, will not smart or blister the soft tissues, and produces little or no sensation when painted on the teeth and gums even of

young children. It leaves no stain on a clean polished surface, but the minutest patch of plaques can be detected readily by its use.

TECHNIQUE OF PROPHYLAXIS.

Dental prophylaxis is a term used to distinguish thorough, periodical work of preventing these dental pathological conditions from the so-called "cleaning," which usually means polishing the buccal and labial surfaces of the teeth with a rubber cup or brush wheel used in the hand piece of a dental engine.

For proper polishing in a prophylactic treatment, points of two different shapes, held in porte polishers, are required: first, a broad, flat point to polish the distal surface of the last molars, and buccal and lingual surfaces of the other teeth; and second, a thin, sharp point to reach the interproximal surfaces and near the point of contact. Dental tape is the only means of polishing one of the most vulnerable and inaccessible parts, *i.e.*, the contact point and its immediate vicinity. Then we should stain and polish until the disclosing solution will show all surfaces clean. Of course, any substance which is not readily dislodged with the wooden point and an abrasive should be removed with trimmers, files or scalers, and the surface thoroughly polished.

It is our duty to plane or file, and polish any etched or roughened surface, for no patient can keep a rough surface clean. Etched surfaces are detected only by careful hand polishing aided by the use of a disclosing solution.

INSTRUCTIONS TO PATIENTS.

When a new patient presents, unless he is suffering pain, let him know what is on his teeth. This can be done by painting the surfaces of the teeth with the disclosing solution; this will not stain clean, smooth tooth surfaces at all. Give him a hand mirror and let him see how much accumulation there is on even apparently clean teeth. Suggest to him that if as much infectious and decaying matter were allowed to remain on one place on his hand, for weeks and weeks, as is allowed to remain on the teeth, he would be very much surprised if the tissue surrounding such a mass did not become inflamed and hypersensitive, as often takes place with the tissues surrounding the teeth. While you are removing deposits, and planing or filing rough surfaces and polishing them down smooth, explain that the enamel of teeth is from 95 per cent. to 98 per cent. calcium salts (*Tomes Dental Anatomy*, page 14); that decay is merely the result of a chemical reaction between the calcium salts of the enamel and the acids which result from fermentation, just as the rusting of a piece of steel is a chemical reaction, and is just as preventable by polishing; how starches are converted into sugars and sugars into

acids, and that all dental caries takes place under plaques (scales), *and only under plaques*; how free acid in the saliva does not destroy the enamel, but that no mouth wash can reach acid under these plaques, and that no amount of brushing seems to entirely remove them, but frequently improper brushing with an abrasive does a great deal of injury to gums and tooth surfaces.

INSTRUCTIONS FOR BRUSHING TEETH.

Also teach him the proper way to handle a brush. The essayist's plan is always to begin brushing on grinding surfaces of the back teeth, with a backward and forward motion, keeping the bristles pointed rootwise, rotating the brush from side to side, so that the bristles just miss the gums on both lingual and buccal surfaces; this is to clean the fissures. Then placing the brush well up on the gums, with a rolling motion, brush towards the occlusal surface, *i.e.*, up on the lower and down on the upper teeth, on both lingual and buccal surfaces. When brushing the lingual surfaces of lower molars, the tongue should be drawn well back so as to expose those surfaces of the teeth to the brush. Frequently I give a demonstration showing the patient how to use a brush, and then have him practice before me until he uses it properly.

It is a very common thing for a patient to start brushing always in one place, usually at the gingival margins of some of the anterior teeth. This should be watched for and stopped, for while few do too much brushing, the brush is always stiffer when first put into the mouth, and this in connection with the first grit, if powder is used, applied in one place year after year, is to the gums and very thinly protected necks of the teeth what the constant dropping of water is to a stone.

I recommend rather small brushes of medium texture. The smaller adult Rolling brush, medium, will meet the requirements in the majority of cases, and a much smaller brush should be used on lingual surfaces of anterior teeth, because a large one bridges over the inside of the arch. *Enough brushes should be kept on hand all the time, so that each brush is used only once in twenty-four hours*, and the teeth and gums should be brushed after each meal.

The chief benefit derived from the use of a toothbrush is the hardened and healthy condition of the gums obtained from massage, but as far as effecting cleanliness is concerned, the brush removes only a portion of loose debris from the tooth surface, and, if not properly handled, does as much damage as it does good.

Cutter's ribbon tape should be used to polish the approximal surfaces, at least once each day. Care should be taken when putting

the tape past the contact point not to allow it to snap against the gum tissue. Snapping against the gums can be avoided by taking a short hold, keeping tape tight, and holding the buccal end somewhat higher than the lingual, so that the tape passes the contact points rather sideways instead of snapping down on the gums.

This, with periodical visits to the dentist, will keep the teeth esthetically clean, but within from two to six days after a prophylactic treatment the tongue will discover little rough patches gathering on the teeth again, and the use of the disclosing solution verifies the discoveries of the tongue. The toothbrush will not prevent the formation of these fermenting patches, nor will it entirely remove them, even when used intelligently, and, to prevent dental caries, it is necessary to have the teeth more than "near clean."

For a number of years I have been giving my patients orange-wood sticks and suitably shaped instruments to carry wooden points, as a porte polisher, with which to polish off the debris which the toothbrush leaves. A No. 4 Johnson & Johnson cotton roll, dusted with Carmi-Lustro, held in a carrier, takes off debris wherever it reaches more effectually than a toothbrush, and puts a beautiful lustre on the teeth. This can also be used to wipe off exfoliated cells and other debris from the gums, cheeks and tongue, and is an ideal way to massage the gums, for circulation can be stimulated until there is a healthy glow, with absolutely no injury to the most tender mucous membrane. The handle end of cotton carrier can be used as a tongue scraper. Patients are instructed to use the cotton carrier several times daily, and to go over the mouth thoroughly once or twice a week with the polisher. Seventy-five per cent. of my patients have become quite proficient in the use of these. Some are very awkward when they first use a polisher, but what child is not awkward in his first attempt to use a toothbrush? It is only by repeated and persistent instructions and demonstrations that the majority of humanity arrive at any degree of proficiency with either a brush, polisher or tape. Any person is awkward the first time he tries to use a pen, but persistent practice makes perfect. I frequently use this illustration.

TOOTHPICKS.

There has been a good deal said about toothpicks pro and con, one person advocating a quill and condemning a wooden toothpick, and his next door neighbor holding just the opposite views. If food has jammed between the teeth, I would advocate the quickest means of getting it out, whether with silk floss or toothpicks, using care not to injure the gums. In fact, I think rubbing the tooth surfaces and gently massaging the gums with a wooden pick is productive of

good results, for it stimulates the circulation and breaks up and removes microbic plaques and other debris, but the pernicious habit of systematically jamming a toothpick into the interproximal space, crowding the gum tissue down, and then giving the pick a twist, thereby lacerating and cutting the gums, should always be watched for, and stopped, just as much as the habit of starting to brush in one place or cross brushing should be watched for and stopped.

Small children should visit the dentist occasionally, but in addition, mothers or nurses should be taught how to use a polisher and floss, and to watch for, and remove, all foreign substances, which are sure to gather on the teeth of most children. Children six, seven or eight years old frequently become educated to the feeling of clean tooth surfaces, so that they detect foreign substances on their own teeth, and learn to handle a polisher and tape, as well as a cotton carrier and brush, with considerable ability.

SELF-TREATMENT.

Patients are provided with the formula for the disclosing solution, a mouth mirror, polisher and cotton carrier. I recommend no coarser grit than XXX silex for polishing the teeth in the office, and usually a tooth powder for the home use of the polisher by the patient.

Even rubbing with the wood points without any grit takes off debris which the brush fails to remove. Soda bicarbonate used on the polisher makes it possible to polish any sensitive places, and is also serviceable for cleaning after the tooth surfaces have been made smooth.

The argument may be used that patients will do damage in this way. A freshly extracted tooth can be cut considerably with a brush and precipitated chalk in thirty minutes of vigorous brushing, whereas three hours of rubbing with the same grit with a wooden point makes no impression except to get a beautifully polished surface. The only reason I can give for this is that the bristles of a brush are so hard that the whole crystal of grit becomes embedded in the tooth, whereas the wood is soft enough so that the grit becomes embedded in the wood, leaving just enough exposed for polishing.

In a few instances where patients have been abroad, or for various causes knew they would be unable to come in for any regular prophylactic treatments, I have given them a scaler or two, in addition to the polisher, tape, etc., and upon their return, in six months or a year, have been well pleased to find in what good condition their mouths were, with practically no deposit, either soft or calcic, al-

though previous to this regime of cleanliness, deposits had gathered very rapidly. I mention this to show how thorough an intelligent person can be when given proper instructions.

For the first six or twelve months a patient should have a prophylactic treatment once every thirty days, but as the mouth becomes healthy and the tooth surfaces polished, and the patient learns how to maintain this condition, the periods for treatment may be extended, but no mouth should go over three months without a prophylactic treatment.

Instruct patients not to avoid crusts and other hard foods, for just as an athlete is developed by strenuous exercise, so is the blood supply stimulated and the teeth, jaws and muscles of mastication developed and kept healthy by strenuous exercise. Then, too, thorough mastication of hard food helps to change the immediate environment of the teeth, and if food is thoroughly triturated and ensalivated, more nourishment is obtained from it, and there will be less desire for over-eating, and, therefore, less danger of unused food products lying in the intestinal tract and fermenting and causing intestinal toxemia to take place. By preventing pathological conditions we lend our aid towards the preservation of health to the entire system.

With ideal oral prophylaxis we should be able to bring a child into manhood or womanhood with a comparatively sound, healthy set of teeth, very small fillings, if any, and well educated as to how a clean set of teeth feels.

PROPHYLAXIS DURING PREGNANCY.

There is no time when prophylaxis is required more than during pregnancy. The bodily resistance of the prospective mother is greatly reduced, and, without proper care, decay progresses very rapidly. The calcium salts, which should be thrown out to protect the teeth, go to make up bone and tissue for the coming child. The attending physician should recommend a visit to the dentist for prophylaxis as soon as this condition has been diagnosed. There should be a prophylactic treatment every month. If the patient is not able to come to the dentist's office, she should have a professional prophylactic treatment at home, and as soon as she is able to be out, one of the first visits should be to the dentist. Prophylaxis should be kept up once a month until the child is weaned and the mother comes back to her normally healthy condition. We should prove that the old saying of a "tooth for a child" is a fallacy. In cases where I have been able to get patients to follow the advice given them regarding prophylaxis at this time, a number of mothers have come through this trying period without even as much as a decalcified spot forming on any of the teeth.

IDEAL PROPHYLAXIS.

Unfortunately we cannot always practice ideal prophylaxis, but are obliged to take cases as they come to us. If the patient is not suffering pain, the first thing to do is to get the teeth clean. This not only retards the process of destruction and gives us a more pleasing mouth in which to work, but it allows us to make suggestions on home care, which should be very beneficial to the patient. If it is possible to get only one, two or three teeth clean in the first hour's sitting, *do it well*; take one tooth to scale, smooth and polish until it is finished, before starting on a new one. Teach the patient how to use the iodine disclosing solution, a polisher and ribbon floss, and impress upon him that at the next sitting you do not want to see the disclosing solution leave a stain any place on the teeth which you have gone over at the present sitting; that the next time you will go over as many more teeth as you are able to, and so on until the entire mouth is put in a healthy condition. Then, if done periodically, thirty to sixty minutes is all that is required for a prophylactic treatment.

Having the patient paint the teeth with the iodine disclosing solution once or twice a week will, by virtue of the disinfecting property of the iodine, stop a certain percentage of decay and tend to keep the gums hard and healthy, but its principal value to us is in locating plaques which are transparent, hence invisible to the eye without its aid.

Shallow, cervical cavities can be ground, filed or planed out, and a high polish put on the tooth at this point. This may leave some sensitive places, but by using soda bicarbonate the tenderness can be relieved so that the patient can help to keep them clean. Milk of Magnesia (Phillips) may be recommended for its acid neutralizing properties. Painting with deliquescent zinc chloride does a great deal to take out tenderness. I also use a good deal of 10 per cent. nitrate of silver on the surfaces which show. This does not stain except on actual decay; 40 per cent. can be used on places which do not often come to view. Either solution retards the progress of destruction. Places of this description should be polished with bicarbonate of soda every day as long as they remain sensitive. Tenderness usually leaves in from one to four weeks after all fermentation has been stoped.

I have quite a number of patients whose teeth were hypersensitive and going rapidly when this regime of clean surfaces was commenced, but under this care they have not had a new cavity in seven or eight years; their mouths are healthy with not a sensitive tooth in them. Of course, if sufficient care is taken to prevent decay, pyorrhea is an unknown quantity.

FEES,

This work should command as high or even higher fees per hour than we would receive if we were making fillings, inlays, crowns, bridges or plates, for we are rendering our patients better service, and a just compensation should be had. In the writer's opinion the class of patients who want this work is far more satisfactory than those who look only to having pain relieved and broken-down teeth repaired.

MISCELLANEOUS SUGGESTIONS.

All cavities should be filled. If improperly contoured fillings be present, they should be replaced with properly contoured ones, carefully finished at gingival margins. When preparing cavities, extend the margins to where they are protected by gum tissue, or can be reached easily with the brush, polisher or ribbon floss (*"Extension for Prevention"*), then cause the cavity margins, as well as all other surfaces, to become immune to decay, by the process of absolute cleanliness. In other words, *"Extension for Prevention,"* but *this time let it be the extension of the immune surfaces.*

If crown or bridge work, which irritates the tissues, which cannot be kept clean, or which is improperly occluded, be present, it should be replaced with work which meets the ideal requirements. In all extensive cases some of the removable forms are always preferable. It is impossible to maintain a healthy condition where a partial plate is worn, which is wholly dependent upon the gum tissues for its resistance to mastication.

Every school where dentistry is taught should have a chair on oral prophylaxis. The man at the head of this department should be chosen as carefully as the professor of operative dentistry. These two chairs should be on the best of terms, and should work in harmony, *i.e.*, fillings, crowns, bridges, etc., should be constructed along the lines that can be kept clean.

Students who have entered a dental college should have a careful examination made of their oral condition; records should be kept, and if the students are not giving their own mouths proper care, instructions should be given them.

There should be periodical prophylactic treatments and examinations, and a part of their grading should depend upon these examinations. In this way every student would know from experience the feeling of a clean, healthy mouth, and unless a man really knows, and believes, what he is advocating, his arguments lack force when he gets out into practice and tries to instruct his patients.

Any student who lacks the ability or does not take pride enough in his own mouth or his chosen profession to practice preventive dentistry on himself, should not be allowed to graduate.

We will do our patients better service by preventing pathological conditions of the teeth, gums and alveolar process than by inserting the best filling, crown, bridge or plate that our most skilled operators are supplying to-day.—*Items of Interest.*



This Department is Edited by C. A. KENNEDY, D.D.S.

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

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SPREADING GUTTA-PERCHA SEAL FOR ROOT-CANAL DRESSING.—In sealing a root-canal dressing with gutta-percha, a pellet of cotton rolled tightly and held in the tweezers, is pressed against the warmed gutta-percha, causing it to spread laterally and fill all the cavity. This precludes the inconvenience caused by the gutta-percha adhering to a hot instrument.—*T. D. Dilks, British Dental Journal.*

DON'T USE A HYPODERMIC INJECTION a second time if the patient suffered any ill effects on a previous occasion. Remember some patients are peculiarly susceptible to the action of certain drugs, and a second dose may have serious consequences.

DON'T FILL THE HYPODERMIC SYRINGE from the bottle. Pour out a small quantity into a glass. Put a bit of absorbent cotton into the fluid and press the end of the needle against this and you make sure that no solid particles find their way in.

DO YOU SCRATCH YOUR MIRROR?—If you make use of the mouth mirror as a protector of the soft tissues in polishing a filling, or grinding down a root, you won't be long before you find you need a new glass. Take a tea spoon, keep it well polished, and of course sterilized, and use it instead of the mirror. You will find it a very efficient tissue shield and reflector combined, and its great advantage is that after it is too much scratched for this purpose it is just as serviceable in its original capacity whereas a scratched mirror glass is completely useless.

POST-ANESTHESIA ACIDOSIS.—After all general anesthesia, it is good procedure to let the patient drink repeatedly, at intervals, a glass of water containing a dram of sodium bicarbonate. If this is vomited it serves as a good gastric lavage. If retained, it tends to forestall acid intoxication.—*S. J. Pope, Journal of Amer. Med. Association.*

IODINE VAPORS PASS THROUGH GLASS.—It has been demonstrated recently in France, according to La Nature, that the vapors of iodine and bromine can really pass through thin walls of glass, even at ordinary temperatures, although in very small quantities. A piece of silver foil placed under a glass tube in which first one and then the other of these elements were sealed was readily attacked by the vapors.

TO CLEANSE THE HANDS FROM LABORATORY GRIME.—Soak the hands in fairly hot water containing about two tablespoonfuls H_2O_2 in about one quart of water, washing with soap and brush.—*Sous Englander, The Dental Cosmos.*

TREATMENT FOR SENSITIVE DENTINE.—One of the first essentials is instruction in the proper method of using the tooth brush and the insistence upon a reasonable amount of time to be devoted to its application. The use of a solution of equal parts of chloroform and chloride of zinc crystals at the points of irritation is good. Nitrate of silver applied in crystal direct to the spot, even better, but best of all for longer periods of relief is the application of heat in the form of red hot instruments passed lightly across the sensitive spot, the part having been previously covered with a small quantity of the oil of cava-cava.—*L. L. Davis, Dental Review.*

GLASS-STOPPED BOTTLES FOR VOLATILE SUBSTANCES.—When volatile substances are placed in glass-stopped bottles the ground portion of the stopper should be moistened with glycerine. This not only makes a more effective seal, but prevents the stopper sticking.—*Dr. Alfred P. Lee, Philadelphia, The Dental Brief.*

SEPARATING PASTER MODELS FROM A COMPOUND IMPRESSION.—In separating plaster models from a compound impression the impression is heated in hot water and then placed under the cold water faucet for two or three seconds. The model can then be removed from the impression without leaving a particle of compound material sticking thereto.—*New Jersey Dental Journal.*

SOURCES OF INVASION IN TUBERCULOUS OF THE MAXILLAE.—Three roads of invasion of the maxillae by tubercle bacilli may be distinguished. First, the tubercular infection may spread from the mucous membrane and the gingival tissue to the maxillary bones; second, from a carious tooth with decomposing pulp, chronic osteitis and periostitis may develop, which are either primarily of tuberculous nature or subsequently become tuberculous. As in tuberculosis of other bony portions of the body, the infection may originate in the bones of the maxillae without the presence and spreading of a tubercular process in the mouth, the oral mucous membrane, or the teeth.—*J. Zilz, Dental Cosmos.*

SANITARY MATRIX BANDS OF TRANSPARENT CELLULOID.—A thin, transparent celluloid strip, 5 3-4 inches long, 1-2 inch wide, and .005 inch thick is procured. Using an ivory steel matrix band as a pattern, with a pair of curved crown scissors, from one to four bands are cut from the celluloid strip. If several celluloid bands are cut at once the rough edges should be smoothed off afterwards with a sandpaper disk. The holes for the retainer are made with a rubber dam punch. A matrix prepared in this way offers several advantages over an ordinary steel matrix band. Celluloid matrix bands are sanitary, as they are used for but one operation. Their transparency enables the operator to see the margins of the filling while the matrix is in place. They are thin and pliable, and therefore adapt themselves easily to the cervical margin in the interproximal space. They are inexpensive and, last, but not least, they are easily removed, thereby preserving the contact point of the filling. A trial will convince the operator of the merits of these matrices.—Edward Jacob, *The Dental Cosmos*.

ON TAKING AN UNDERCUT IMPRESSION.—Herr Otto Schultz contributes the following suggestions on taking a lower impression in cases where the second molar, having nothing to meet in the upper jaw, have fallen out of place: A piece of soft stent should be carefully moulded to the falling sides of the teeth and then withdrawn and smeared with vaseline and a model of the whole jaw taken with plaster in the ordinary way. Since the stent model will not come away with the other model (N. B.) He has omitted to say that the stent should be replaced in the mouth. It must be separately removed and carefully put in its place.

ALLAYING PAIN IN ACUTE PULPITIS.—In acute pulpitis even the most severe pain can be eradicated within half an hour by the following method: The cavity is first cleansed mechanically and then wiped with a pellet of cotton saturated in 95 per cent. alcohol, this to be followed by an application of concentrated carbolic acid. A small pellet of cotton is then placed in the bottom of the cavity, after having been saturated with a mixture of 20 grains of compound tincture of benzoin and 1 gram of novocain. The cavity is then sealed with a cotton dressing covered with collodion or sandarac varnish. Before retiring, as a prophylactic measure, one or two tablets of trigemin are given, which is a combination of butyl chloral and pyramidon, and an excellent hypnotic and anolgesic in pain of the trigeminal nerve—*L'Odontologue*, per *Deutsche Zahnärztliche Zeitung*.

ORAL HEALTH.

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EDITORIAL.

A DEPARTMENT OF DENTAL SURGERY.
FACULTY OF MEDICINE, UNIVERSITY OF TORONTO

THE Faculty of Medicine of the University of Toronto has established a department of Dental Surgery. Dr. A. D. A. Mason has received the appointment of demonstrator for the department.

Dental surgery is rapidly receiving recognition as one of the most important specialties of medicine. From a lowly beginning, when it was "practised" by any individual who could manipulate the crude instruments used in extraction, it has grown and developed into a distinct profession, with a usefulness to humanity second to that of no other branch of the healing art, and with an honorable and enviable record of scientific attainment.

This growth of a great specialty of medicine has taken place entirely apart from the development of medicine as a profession. This has perhaps been not altogether a disadvantage. The time has arrived, however, when there must be a closer relationship between the professions. It is becoming daily more necessary for the dental surgeon to have, and to apply in practice, a broader knowledge of the sciences. On the other hand, both the physician and surgeon in many cases need the co-operation of the dental surgeon in diagnosis and treatment. The vital importance of mouth conditions in

the development and spread of many diseases renders it highly important that medical students receive a better training in this particular field than has hitherto been given them.

It is therefore gratifying to note that the Medical Faculty of the University of Toronto has taken this step. The new head of the department, Dr. Mason, is also the dental surgeon on the staff of the Toronto General Hospital, which is virtually part of the teaching equipment of the Faculty of Medicine of the University. The Out-door Clinic of the Hospital will afford clinical material for the demonstration of mouth conditions and their proper treatment.

We look for a great deal of good to both professions in increased breadth of view to result from this appointment. Dr. Mason is personally and professionally a gentleman who is well fitted to render valuable service in this new department.

DECAYED TEETH AND INFECTIOUS DISEASES.

IN Montreal a most elaborate Isolation Hospital has recently been built.

The building has been laid out with a view to preventing infection of any kind. Clothes are sterilized before washing. A furnace is provided for drying them. Separate apartments are provided for nurses and domestics. All the flooring is concrete and fireproof. Matters are so arranged that if there is only one patient, one room only will be occupied by him, and the rest of the hospital segregated from infection. Disinfecting apparatus and baths of all kinds are provided without number.

But what is the use of all these precautions if a patient runs the gamut and is then discharged from quarantine with the disease germs lodged in his teeth. Cases are on record where it seemed impossible to stamp out an epidemic until it was ultimately discovered that the infection had been carried by decayed teeth.

A modern isolation hospital is incomplete without a Dental Department. The time is surely not far removed when Health Officers will object to the discharge of a patient from quarantine so long as the teeth remain carious and the oral cavity in a condition of inflammation and disease.

THE ALBERTA DENTAL ASSOCIATION.

THE Alberta Dental Association, at its annual meeting, elected the following officers:—President, Dr. Hoare, Wetaskiwin; Vice-President, Dr. Holt, Medicine Hat; Secretary-Treasurer, Dr. McPherson, Edmonton.



LOOKING FORWARD

BY EDWIN A. NYE.

“Remember Lot’s wife.”

Harsh penalty?

Maybe. But the story carries a valuable lesson.

And that lesson is that the golden age is not behind you, in the past, but in front of you, in the future.

Let the dead past bury the past. You may have regrets concerning your failures or your sins, but do not let those regrets get in front of you and impede your going.

Remember Lot’s wife.

The old idea that man has fallen from some great eminence to a lower plane of life is giving way to the new idea that he is slowly struggling upward out of imperfection into strength of character and purity of living.

Keep your face to the front.

You are not what you want to be or what you ought to be, but you never will be what you should be or long to be if you go about forever mourning on account of your mistakes and lapses. You will be like the prisoner who drags behind him his ball and chain.

Forget the things that are behind.

Flowers are not made.

They grow.

And so of humans. You are in process of fashioning. The lily is not the less beautiful because its roots are in the mud.

Do not weaken yourself by sorrow for your misdoings. Look not backward to the cities of the plains where sordid sin abounds, but forward toward the better country toward which you are travelling.

Remember Lot’s wife.

About face! Heed not the call of the irrevocable past, and—

Forward march!



The matter of oral sepsis is of urgent importance in relation to the whole multifarious and widespread group of affections—medical, surgical or dental—caused by the actual presence of toxic action of pyogenic organisms. I am satisfied that by suitable measures the evil of oral sepsis could be largely prevented, and that it is of more importance than caution to keep typhoid or tubercle infection out of the water and milk we drink or the air we breathe.—*Sir Wm. Hunter.*



DR. W. A. EVANS, Chicago

DR. W. A. EVANS

AN APPRECIATION

By DR. C. N. JOHNSON.

Chicago, Sept. 23rd, 1912.

To the Editor of Oral Health.

Dear Doctor:

I have just learned with pleasure of the address by Dr. W. A. Evans, of Chicago, before the citizens of Toronto, on "The value of a Public Health Department to a Municipality," and it has occurred to me that your readers might be interested in knowing something of what Dr. Evans has done for the cause of Public Health in general, and of oral health in particular. As you are all doubtless aware Dr. Evans was for some years Health Commissioner of the City of Chicago, in which capacity he demonstrated a genius for such work in a manner to claim the attention of public health authorities throughout the world. Never have I known of one man accomplishing so much of real benefit to the public in a given time as did Dr. Evans. He has a faculty of going straight ahead in the solving of public health problems regardless of favoritism or ulterior influences. He sees nothing but the reform to be made, and the result is that he usually succeeds in making the reform. If by any chance he is thwarted or thrown down, he simply gets up again and goes on as before. Nothing daunts him.

But to the dental profession his chief distinction lies in the fact that he has done more to call the attention of the public to the significance of oral hygiene than any other man with whose work I am familiar. It has been my privilege to appear with him on many a public platform where the subject of oral hygiene was the chief topic, and I have never failed to be entertained and thrilled by his eloquence and his logic. Indeed I feel that he has been able to do more for our cause than we have ourselves, because of the fact that, being a medical man and not a dentist, his utterances have carried more weight than ours from the conviction on the part of his hearers that there could not possibly be any ulterior motive behind them.

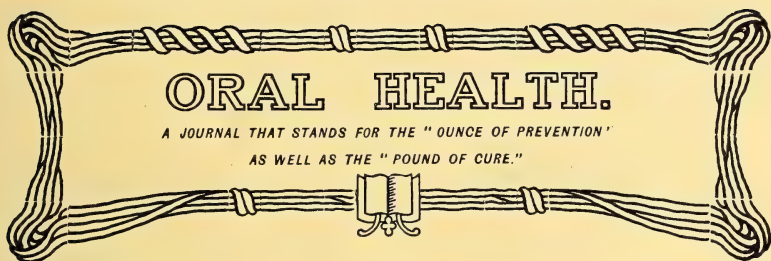
It was through his influence that a dentist was appointed a regular member of the Department of Health of Chicago, an appointment which has done more to give a status to the dental profession in the eyes of the public of Chicago than any other one movement. While Health Commissioner he pointed out repeatedly the intimate connection between bad oral conditions and the general health, and called attention in no uncertain tone to the dangers of carrying contagion through the agency of neglected teeth.

Since leaving the city service he has conducted a department on the Editorial page of the CHICAGO TRIBUNE entitled "'How to keep well,'" and it is safe to say that in this capacity he has reached a greater number of lay readers than any man who has written on the subject, and he is accordingly doing a much needed educational work.

It is quite unnecessary for me to write further of Dr. Evans and his work, because by this time those interested in such things in Toronto are familiar with what he is doing as illustrated by his recent lecture, and yet I must confess to a very great pleasure in being permitted to express my personal appreciation of his signal worth to humanity, and his cordial attitude toward the dental profession. And I am all the more delighted to do this on the present occasion when I recall the fact that years ago my first real introduction to him came in the form of a very vigorous debate in public in which we chanced to be pitted against each other. I have been told by those who heard this debate that it was somewhat active at times, but looking back at it now I am inclined to smile, as I am sure does Dr. Evans if he ever chances to recall it.

Sincerely yours,

C. H. Johnson



Vol. 2

TORONTO, OCTOBER, 1912.

No. 10.

THE VALUE OF A HEALTH DEPARTMENT TO A COMMUNITY.

BY DR. W. A. EVANS, CHICAGO.

(Resumé of address delivered at an open session of the Canadian Public Health Association at Toronto on Sept. 16, 1912.)

DR. EVANS at the outset referred to his subject as being a hard one, as it is impossible to estimate the value of human life.

The value of a life has been variously estimated. At times it has been estimated upon a basis of legal value. Others have made an estimate upon the net commercial value of a life, carefully computing the excess of earnings over spending. None of these estimates, however, are actuarially sound.

To some a Health Department always conjures up balance sheets, ledgers and figures. These would value a Health Department upon the basis of its per capita cost, but this can be no more done than to estimate the value of a cigar by its cost.

Others again figured upon the basis of the immediate need. These are not the friends of efficiency in health work, as such support is at best spasmodic and usually withdrawn when difficulty or danger is past.

THE ADVERTISING VALUE OF GOOD HEALTH.

Much importance was attached to the advertising value to a community of an efficient Health Department. When this fact is more generally recognized by city and county councils a more generous financial and moral support will be given the Medical

Officer of Health. In this connection Dr. Evans referred to many cases where frequent epidemics had seriously hampered the growth of communities, and also pointed out that when a family contemplated a change of residence the district's health record was one of the first questions considered. No thoughtful man would take his family into a community where health standards are low.

COMMERCIAL PROSPERITY.

There is a fixed relationship between a community's health and its commercial prosperity. It has come to be an axiom that as the health and welfare of the workmen so the prosperity of the community. There is no growth in a community that has a debased health conscience. Those cities whose reputation is fair and whose records are rarely cursed by epidemics are the cities that have prospered. Those towns have prospered that have looked well to the physical welfare of their citizens, and no town prospers whose name bears the stigma of bad sanitary conditions.

NATURAL WEALTH AND HUMAN EFFICIENCY.

A warning note was sounded that Canada should not thoughtlessly draw upon the natural resources of the country and sacrifice the wealth of field and forest which has been stored up by nature through the centuries. This was Canada's heritage—the principle sum—and not to be drawn upon as though it were for the sole use of the present generation. A Health Officer with a large vision of his work would be a leader for conservation of land and forest.

It is an easy thing for a young country to be commercially and financially prosperous as long as it draws upon the invested wealth of the centuries. The kind of prosperity that was worth while was the result of human efficiency independent of natural resources. Germany was referred to as a country that had kept abreast of the times by increasing the efficiency and raising the standard of its citizens. Let us have the wise leadership of a Bismarck, and, forgetting our natural wealth and the minor and unimportant political problems of the day, start to build up efficient men and women. People are thinking along new lines. They are demanding higher human efficiency.

THE INSURANCE BILL.

Dr. Evans referred to the National Insurance Bill recently passed by the British House of Commons as the greatest health measure of modern times, and predicted that under its operation the British death rates in tuberculosis would be further reduced. It directly taxes those who are directly responsible for a high rate of mortality. If it should happen to be a community and not an individual, then the community had to bear the increased rate of insurance. The bill also provides for proper maternity service and

the hospitalization of women during maternity. In connection with the bill, Dr. Evans referred to the attitude of the medical profession in Great Britain, and said there had been few things more surprising to the public than the unexpectedly threatening attitude assumed by the doctors. The community had been so accustomed to regard medical men as amiable weaklings in business matters, easily gulled by piteous tales or flattering remarks about the magnanimity of the profession, that the idea of what was called a "strike" of doctors seemed to be rather amusing. It was only after several months that the public began to realize that the profession was showing itself in a new light and was determined at all costs to insist on certain definite provisions being included in the bill.

NATIONAL SERVICE OF HEALTH DEPARTMENT.

The national significance of Officers of Health was shown in the achievements of the United States in both Cuba and Panama. Cuba had been found a pest-hole of filth and disease and had been left a fit place in which to live. The construction of the Panama Canal was made possible in a tropical climate by the advancements of preventive medicine and sanitary science. A great national work was being accomplished without sacrifice of human life.

CHILDREN AND PROPER HOUSING.

A government cannot afford to have children brought up on city land, the cost of which was almost prohibitive. Land should be held by the State for the proper housing of workmen. Building laws should not only provide breathing spaces between houses, but also larger windows for admittance of plenty of sunlight and pure air.

Eugenics—the science of seeing that children are well born—was one of the most important studies of modern times, he said. It was the duty of nations to see that there was no waste of life in childhood. This was a day when the demand was loud and insistent for more efficient men and women. It was the duty of the State to see that this demand was supplied.

It takes vision to see the scar on the body as a neglect of childhood. It takes more to see the necessity of being born well.

THE DAWN OF A NEW DAY.

The present rate of mortality in organized districts could not be further reduced to as great an extent as in the past. It was predicted, however, that National Health Measures would make still greater reductions in mortality. Dr. Evans drew a most inspiring picture of the limitless field of service of health departments and held out the hope that the theories of to-day would be put into

practice to-morrow. It was claimed that the public now demands this.

The speaker said that people are tiring of deaths from preventable diseases. They used to think that such deaths resulted from a special intervention of God, and that man was helpless to prevent them. Now they know that someone had sinned, either an individual, or a community, or a nation. They will not stand it any longer. They are crying for better things. The light is breaking. Old political problems are being thrown into the scrap heap, and people are demanding new leaders capable of leading them to a solution of problems that count for more in the national welfare and whose solution will result in greater human efficiency.

THE DENTIST'S WAITING ROOM.

WRITING in the *Church Family Newspaper*, Mrs. Evan Rose comments as follows:

"I had to spend a little time last week in a West End dentist's waiting room, and was interested in comparing its appointments with those of others known to me in earlier days. The dentist's waiting room was once a gloomy chamber, scarcely less depressing than his own special sanctum.

"Very different was the room into which I was ushered last week. It was bright, lofty, and cheerful, with windows wide open to let the sunlight stream in. Dainty cleanliness was its chief characteristic. The ceiling was spotless, the walls were decorated in pale green, and a rich, soft square of carpet in the same cool tint covered the floor. The hearth-stone sparkled with copper fittings. The windows were daintily curtained with creamy muslin.

"Several vases of sweet peas and roses stood on the wide window-ledges and on the writing table. On a round table in the middle of the room there were copies of *Punch*, *The Sphere* of the last two months, with one or two up-to-date fashion journals. A Chesterfield sofa, freshly upholstered, was the only large piece of furniture. The general decorative effect was pleasing and soothing to the eyes. This was a room in which one might laugh, discuss holiday plans and prepare with tolerable equanimity for the serious business of the morning.

"The first charge on a professional man's income nowadays is the upkeep of his home and office in freshness and artistic perfection."

THE DENTAL SURGEON'S HEALTH.

BY A. D. A. MASON, D.D.S.

DURING the past few years considerable attention has been given to the subject of public health by both the Government and public press. The authorities have at last come to recognize the value of the individual to the community, and the subject of good health now occupies a leading place in the public mind.

The dental profession has been called upon to play an important part in public health campaigns and will no doubt take an even greater part in such work in the future. As a profession we must "boost" the good-health idea and individually do all in our power to show the need for concerted action in such noble work.

But while dental magazines are loaded with public health concern, are we not overlooking the individual practitioner? What about the dentist's own health? Little attention is paid to a matter of such great importance. In the past, appeals have usually been made to the dentist, that he preserve his health for the sake of himself and family. That appeal is as forceful to-day as ever. Yet there are other grounds for urging greater attention to the problem of the health of the individual dentist.

The dentist should preserve his health for the sake of the better service he will be able to render—for his patient's sake. He should preserve his health for the sake of public health problems, problems that he must as a dentist help to solve. He should also maintain a health standard for the sake of his profession. What type of young man can we hope to attract to the profession if the present generation of dentists spend their lives within narrow limits, getting out of touch with world affairs and ruining their health by a too close application to office practice?

In self preservation, the profession must urge its members to have interests outside the office, and live a life that will make for efficiency in mind, purpose and body. These three spell success, and the degree to which a man meets these three demands, is the degree of success attained.

Two things are essential to the preservation of the dentist's health. Firstly, he must conserve his energy, and secondly, store energy by proper relaxation.

For the conservation of energy, the best and most efficient dental appliances should be used. The dentist who persists in using antiquated office equipment is wasting energy and literally wearing himself out. Where their use is possible electrical appliances are indispensable. They enable one to accomplish one's work with the minimum of strain.

The man who continues to stand incessantly while operating wastes energy. The energy that should be expended upon the work in hand, oozes away through weary back and limb. Continual standing also produces serious foot trouble, and if persisted in, the overworked feet will make their presence felt well into the hours of sleep. The greatest possible boon to the dental office is the adjustable dentist's seat which is undoubtedly of the greatest benefit to the operator.

Having supplied our office with the best equipment we must systematize our work so that we will not have to rely solely upon memory. Pigeon-hole your work so that it is not forgotten, and as you look at your desk or cabinet you know what has to be done and in what time. Then when you leave your office leave your troubles with it, and take an unburdened mind home to enjoy the evening hours.

Now as to the storing of energy. The greatest amount is, of course, stored during sleep, and if one cannot get the required amount on account of overwork or nervousness (both very common in the dental profession) then a few day's rest will prove beneficial in most cases.

But there yet remains a third or more of our entire time which ought to be spent in storing strength for our day's work, and to get the best out of this period every man should have a hobby which will keep him out in the fresh air. Dental work is so close and confining that it becomes imperative for the dentist to spend as much time as possible in the open.

We should also have a definite time for taking our recreation, for if such be not the case we allow our work to infringe to the detriment of our health.

There are a great many different recreations that a dentist can pursue such as walking, golf, tennis, rowing, sailing, bowling, gardening, photography, skating, curling, horseback riding, motoring, etc. Personally I take keen interest in riding and will conclude by pointing out a few of the advantages of that sport.

If one marks the appointment book on Tuesday and Thursday at 4.30 and Saturday at 3, and will persist in riding a horse for one and a half hours on those days, he will no doubt live longer and

feel one hundred per cent. healthier. There is no better exercise for bringing all the muscles and organs of the body into activity with the least amount of exertion. One is in a sitting and restful position and at the same time in motion. The nervous strain is released and as you ride along the bridal path or country road your mind is far removed from thoughts of the office. The sensation is exhilarating and can be indulged in during all seasons. Besides, there is the company of your faithful animal, and if you have any love in your nature he will surely find it. The pleasure of control in getting your mount to bend to your will and desire is so delightful that you need no other companion. If your friend disappoints you at the last minute you still have your partner for the game and do not have to make a postponement.

Needless to say, every man has to make his plans for recreation hours to suit his local conditions. The important thing is to make plans and then carry them out.

Your health is your greatest asset. Preserve it.

HOW ATHLETES LIFT HEAVY WEIGHTS WITH THEIR TEETH.

THE apparatus by the aid of which athletes lift and carry heavy weights consists of an iron hook with a thick leather attachment, consisting of several layers of leather sewed together and made to conform approximately to the shape of the palate. The muscles of the face and neck really carry the weight, while the mandible simply serves for fixing the apparatus. A great many performers, of course, employ trick appliances, by which the muscles of the abdomen and the legs are made to carry part of the weight.—*Revue de Stomatologie*.

INFLUENCE OF MASTICATION ON THE CONDITION OF THE TEETH.

INVESTIGATIONS on the children in the town of Koetzling, in Bavaria, shows that of those who eat hard bread, the percentage with bad teeth was 6.9; of those who eat both hard and soft bread, 8.2; of those eating only soft bread, 10.5. In the town of Ithringen (Baden) the percentages before and after the introduction of soft bread were as follows: In 1894, when only hard bread was eaten, 12.4 per cent.; in 1897, just after soft bread had been introduced, 12.9 per cent.; and in 1901, when most of the bread consumed was soft, 20.9 per cent.—*Dental Record*.

REPORT OF THE DISPENSARY COMMITTEE MASSACHUSETTS DENTAL SOCIETY.

Read before the Mass. Dental Society at its 48th Annual Meeting, May 2, 1912, at the Harvard Dental School.

LAST year the Dispensary Committee gave a brief historical survey of the antecedents of dispensary work in Massachusetts and of the establishment of dental dispensaries, the earliest of which date from the winter and spring of 1910. A short account was given of the dispensaries in the Massachusetts General, the Waltham Hospital, and the Memorial Hospital in Worcester; of seven social service dispensaries in and near Boston and of dispensary work in the schools of Somerville, Revere, Winchester and New Bedford, with brief accounts of activity elsewhere. It is purposed in the present report to note the changes for better or worse in the dispensaries antedating May, 1911, with some account of what has been accomplished within the year. It is believed that helpful conclusions may be drawn from this review.

No marked change has taken place in the efficiency of the dispensaries in the three hospitals just mentioned, except that it is planned to add to the equipment and working force at the Massachusetts General Hospital Clinic, and that a reduction from four to three has been made in the open days at Waltham with a corresponding loss in the number of dentists attending. The work at Memorial Hospital, Worcester, moves steadily on. There is no lack of financial support, and, what is far more important, the number of dentists from which to draw recruits to take the place of those who step out is large.

At least one hospital dental dispensary has been started during the past year; this is at Grace Hospital, Kingston Street, Boston. The clinic resembles that at the Massachusetts General, except that as yet it is not so fully developed, and the oral surgery does not form a separate department.

The management of the Homeopathic Hospital on East Concord Street, Boston, is ready to establish a dispensary when workers can be found.

Turning to the social service dispensaries, the changes are found to be more numerous and more vital. The work at the Boston Dispensary is so well established that no change is likely except for the better. On the other hand, the Berkeley Dispensary is crippled for

lack of helpers. At present two men give their services with the burden mainly upon one of them. The authorities in charge would gladly increase the equipment if only workers could be secured. The Dispensary is open Tuesday and Friday from 10.30 to 12, but it is difficult to compress the work within these limits. The service which has been offered at Anderson Street has been transferred to 140 Mt. Vernon Street, but beyond this fact little can be reported. Work at the North End Dispensary has been discontinued, but partly to take its place a dental dispensary has been opened at the Hull Street Dispensary, with the Metropolitan Dental Hospital Association in charge. About twenty members of the association are accepting appointments. Ten dentists are at present giving their services at the Lynn Dispensary. This portion of the beneficent work of Neighborhood House is open to the school children every afternoon; it is privately supported, the charge covering only the cost of materials. There has been no falling off in the service for the Martin Luther Orphan House at West Roxbury. Forty-six inmates have been cared for during the year. Last year the authorities in charge felt that the remarkable health of the children was due in no small degree to dental oversight. Not a child has been sick during the past year, and only \$2.77 has been spent for medicine.

An evening clinic started during the past winter at the Harvard Dental School, is more than an equivalent for certain losses in services elsewhere, in that a need has been supplied which has not been met by any other clinic. Only one other report of an evening clinic has come to the Dispensary Committee. It may not be out of place to mention that the increase in the number of students at the dental schools has rendered possible a wider distribution of the incidental service of these institutions.

Lastly, may be brought to mind the rising walls of the Forsyth Dental Infirmary for Children, where, before another May comes round, a work of health and healing will have been inaugurated.

The school dispensaries and the dispensary work at Somerville, Revere, New Bedford, and Winchester have felt, as a whole, a slight falling off in service during the year, but there have been counterbalancing gains. At Somerville a woman assistant has been attached to the dispensary, which promises greater efficiency in many ways. Tooth brushes and tooth powder have been sold at cost. No change in the dental work is noted at Winchester, except that a little closer attention has been given to the teeth than has been possible heretofore. Tooth brushes have been supplied to the school children at cost. During the year all the pupils in the schools (1,411) have had their teeth examined, and 122 have been treated by the several dentists at a nominal charge. The income from a local

fund is now available, where parents cannot afford to pay the amount required for extensive dental treatment. At Revere the number of dispensary workers has been increased by one. What is true of this dispensary is true of others, that a vital interest in the work is not felt by all the workers, or not so felt as to result in constancy of service or an equal division of the burden. The school physician reports the mouths of the children to be in much better condition than last year or the year before. In 1910-1911 the dispensary was open 31 afternoons and 160 treatments were given. The dispensary at New Bedford, started a little more than a year ago, continues its efficient work along the lines described in last year's report. The following is quoted from a recent account of the work: "Every dentist is giving his time who went into the work at the start. The city appropriates funds for maintenance. We hope this is but the beginning of what the work will develop into."

Reports of dispensaries starting during the year have come from Cambridge, Provincetown and Sharon, and of dispensaries about to open, from Lowell and Chelsea. Through the aid of a dental committee, a dispensary was established in Cambridge in February, 1912, and opened at the Wellington School. The equipment and the sustaining funds come from private subscription. Twelve dentists render service, two working in conjunction. Pupils in the elementary schools are eligible, and the selection is made by dentists and principals of the schools. There is no nurse, and as yet there is no extracting. When parents can afford it, a small fee is charged to pay for the expense of materials.

The dispensary in Provincetown is open every Saturday with two dentists in attendance. The teacher and school physician select the cases. The work is supported by the fees, which are half the regular fees. It is estimated that one hundred children have been treated.

The work at Sharon, which was established by the School Committee, is exceptional, in that it is conducted in the evening. One dentist is in attendance. Teachers make a selection of cases from children in the grammar schools. The work is supported by fees which are from ten to twenty-five cents.

In Lowell the School Committee has voted to open a dispensary, and an unused schoolroom is to be fitted up for the purpose. An appropriation of \$900 has been made for an equipment, and the dental society of the city has passed a vote offering services.

A room has been selected for a dispensary in the Williams School Building, Chelsea. The aldermen have appropriated \$450 for an equipment, and the School Board will pay the cost of materials.

The dispensary will be open Tuesday and Thursday afternoons during the school year. Ten dentists have promised service. There will be no charge to pupils.

Each of the seven dentists in Dedham devotes one-half day a month to dental service for the children in the schools. The selection of cases is made by a school nurse. The plan was started in January, 1911.

To the foregoing accounts of dispensaries, many notes of progress might be added. Some of them are embodied in reports to the Dispensary Committee, others gleaned from miscellaneous sources. In Boston, for example, an important forward movement in dental hygiene and preventive dentistry as applied to schools is in progress. The vote embodying the new provisions was passed as recently as April 15. The subjects both of education and treatment are set forth in a document so carefully prepared, so complete in understanding and so wide in scope that no forward looking dentist who wishes to be conversant with the best which has been thought out in this department of dental hygiene can afford to leave it unread. This movement follows an extensive and thorough examination of the teeth of the school children during the past winter. No school dispensaries will be started, for reliance will be placed on existing helps, but in other ways it seems likely that all will be done which can be done.

Brookline continues in the front rank in the study and practical working out of dental problems as applied to schools. By the aid of funds, privately collected, needy school children are cared for in the offices of the dentists, the compensation for the service being one-half an average dental charge.

The work of examining the teeth of the children in the town of Norwood was begun by the school nurse last spring (1911), and before the close of the school year 1,296 children had been examined, 827 of whom were found to have defective teeth. Ninety-three children consulted a dentist as a result of the examination. In the fall and winter six local dentists thoroughly examined the teeth of 840 children. As a result many children received treatment.

In Ludlow an arrangement with the local dentists for a reduction of 25 per cent. in charges, following an examination of the teeth of the children and a recommendation to parents, is stated to have had very little result.

The report of the local dentist who made examination in the town of Medway contains the following: "Generally speaking, the results of my inspection bear out the usual findings of dental examiners in the schools—namely, that a big percentage of the pupils have defective teeth and unclean mouths. Many children make no

attempt at cleaning the teeth. Many have no tooth brush, and many who have one seldom use it. In one room all but half a dozen pupils suffered more or less with toothache. That these children can do their best work or attain even 50 per cent. of their normal ability is impossible. If parents and guardians really knew how much an unclean mouth and defective teeth contributed as a causative factor in producing various physical and mental disorders, how much it contributed to susceptibility, to contagion in many epidemics, and how it interfered with the mental development, there would be less or no neglect evident in the mouths of our children."

By an arrangement between the school authorities and dentists in Canton, Marblehead and Easthampton, school children receive treatment for a normal charge or without charge.

The charitable work in Springfield was referred to in last year's report.

From the reports which have come in from different parts of the State, and especially from the facts already given in this report, it is not difficult to summarize and draw conclusions. The greater number of cities and towns throughout the State have no dental inspection in the schools. Where there is inspection it is usually conducted by the school physician in connection with medical inspection. Not that inspection is necessary to the starting of a dispensary (dispensaries have been started without it), but where there is inspection by dentists it usually indicates antecedent interest, and is more likely to lead to an awakening which will insure practical results.

That these dispensaries are all located east of Worcester, and three-fourths in the greater Boston district is a fact that may well challenge attention, and a study of the conditions might prove instructive.

An encouraging sign of the times is found in the greater reliance which is being placed on a woman helper in dental inspection and in connection with the dispensaries. The following rules taken from the new dental code of the Boston School Committee indicate the importance of the nurse: "The methods of bringing these principles home to parents and pupils should include teaching and reiteration of these principles (of dental hygiene) by teachers to the children and an explanation by nurses to the parents." "Frequent physical examinations of the children's teeth by nurses and teachers to see whether they are clean." "The use of the tooth brush should be taught in the home by the nurse or kindergartner so far as the ground can be covered by the present force."

To any one familiar with the working of a school dispensary

where accurate records are kept, a charge made for service, tooth brushes and tooth powder distributed, and a definite and constant help given to the operators, it would seem little exaggeration to state that a women assistant would double the amount of good which might be accomplished.

Another encouragement appears in the greater willingness of cities and towns to grant financial aid. Too much reliance should not be placed upon the three or four instances of this kind, though it is hardly likely that the movement will halt where it is.

After all the great factor is the dentist himself. That he has lost heart somewhat under the pressure of an unpaid service, in conditions more or less unsatisfactory and trying, is not surprising; rather is it not surprising that he has become so little disheartened? Most dental offices are conveniently arranged. The dispensary is often inconvenient in arrangement or at least practically so, as nothing is in a place where the operator expects to find it. Then there is the lack of standardized methods, of customary materials, instruments and appliances. Under these conditions there is the discouragement of feeling that one has not accomplished more than half what might be expected. Furthermore, in one instance at least the dispensary was sought by patients well able to pay a full fee, with the result that there was a falling off in the number of workers. The remedy for this evil was found, though almost too late, by careful investigation in the homes of the children by the school nurse and in an increase in charges.

All the difficulties or a large proportion of them are remediable, and it is the work in spite of the difficulties that is the important question. In this work dentists have found a satisfaction they had not counted upon; the satisfaction of joining hands with fellow workers in a good cause, of looking out in a new way beyond the boundary of personal interests and of feeling the solidarity of the great army of social workers everywhere.

The benefits resulting from the dispensary are not easily overestimated. First and foremost, there is help to the patient in many ways. The dentist finds a stimulus to his finer nature; schools are rendered more efficient, with a tendency toward a reduction in the cost of maintenance; and as a dispensary tends to reduce the amount of sickness, it becomes a public economy in every community where it is located. Its extension is a sign of increasing interest in social betterment.

Respectfully submitted,

HENRY H. PIPER, D.D.S., D.M.D.

Chairman of Dispensaries Committee of Massachusetts Dental Society.

—Journal of the Allied Societies.

PREVENTIVE MEDICINE AND THE SCHOOLS.

THE day is not far distant when even small communities will as soon think of running a school without making provision for instruction on preventive medicine as they would of running it without a principal," declares Dr. George B. Young, Public Health Commissioner of Chicago, in the *University of Wisconsin Bulletin*. He says, in part:

"The vision, the hearing, the speech of pupils, their physical deformities, their mental defects, their nutritional status, all have come to be matters requiring attention by medical inspectors of schools, and justifying correction at the expense of the community if the circumstances make it necessary. We have at last come fairly to understand that if the child is unfitted for general school conditions we must fit the conditions to the child, and so have arrived at the school breakfast, the open air school for the tubercular, and the like.

"To point out the causes of the diseases and defects of school children is only going half the distance," he continues. "We are becoming convinced that the true method is to work for the removal of the conditions which permit these causes to become operative. These underlying conditions almost all arise from the poverty that has its roots in industrial inefficiency, the ignorance that hinders the advance of the poor and the unsocial narrow-mindedness that limits the appreciation by the well-to-do of their duty to their fellow men.

"These things operate in turn to produce bad housing, under-feeding, high infant mortality, blindness, deformity, and insanity." —*The Public Health Journal*.

MR. CARNEGIE TO ABERDEEN UNIVERSITY STUDENTS.

MR. ANDREW CARNEGIE, in his rectorial address to the students of Aberdeen University, offered some advice to those about to make a start in life.

"Most of you," he said, "are probably to choose one of the professions, where wealth has second place, in which lives of constant but elevating toil are certain, but with the gratifying fact that you will have the proud satisfaction of knowing you are in a

region of effort in which service rendered, not pecuniary reward, is the primary aim. Your aim is high; possibly you may make some discovery which enlarges the bounds of human knowledge, renders improved modes of operation possible, or you may shed light upon what has hitherto remained obscure.

“There are many brilliant examples of professional men making the world their debtors. Much better that you should indulge such dreams, for even if these never be realized you will at least have had your dreams, which is always something to the good. Into noble dreams properly nourished you may instil the germ of life. Aim to play a leading part in your youth, and if fame should devolve upon you later you will be in your element.”

Reviewing the rapid advance of democratic government throughout the world, Mr. Carnegie expressed the opinion that we could not, and should not, expect “the present unequal accumulations of wealth” to endure.

“The co-operative system of production, with its thousands of owners, is the entering wedge,” he concluded. “In the United States Steel Corporation there are to-day more than 30,000 workmen shareholders, and the number is rapidly increasing. Here lies, I believe, the true and final solution of the problem—Capital and Labor pulling together in the same boat as joint owners. Adam Smith lays down the doctrine that man should contribute to the State in proportion to his ability to do so. While an income tax during life may have some serious but still not overwhelming objections, there is no objection whatever to one-half of the millionaire’s hoard being taken by the State at his death.”

CASE OF PARTIAL PARALYSIS OF THE FACE FOLLOWING COCANIZATION OF THE PULP.

On the 12th of February last, between the hours of 9 and 10 a.m., Mr. M. visited my office for the treatment of a left superior cuspid. The day before I had inserted an arsenical application, sealing the cavity carefully with temporary stopping. The next morning, at the time above mentioned, I removed the same, and found the pulp showing some signs of life. I then cleansed the cavity thoroughly, removing all traces of the arsenic, which had been placed over a slightly exposed portion of the pulp, and next placed a pellet of neurocaine in the cavity, adding a drop of water in order to dissolve it. I then inserted a pellet of unvulcanized rubber and applied pressure in the usual way.

The patient experienced a slight twinge of pain upon pressure, lasting but a few seconds, after which I was enabled to remove the entire pulp painlessly. Considerable hemorrhage persisting, I decided to dismiss the patient, after placing in the canal a cotton dressing, saturated with a mild antiseptic. About 9 o'clock the same evening, after the patient had retired, he was awakened by a peculiar sensation in the left side of his face. I will let you have his own account of his experience. I will here state that the patient is the editor of a newspaper and (naturally) of an imaginary temperament—though not given to Munchausen tales. Mr. M. said: "About 9 o'clock the same evening I was awakened by an uncomfortable numbness in my face, on the left side. There was no feeling in my left cheek, from the middle of upper lip as far back as the ear. The tongue was numb, and I was unable to open my jaws. I became very much frightened, thinking that I had a stroke of paralysis. I got out of bed and applied hot cloths and liniment; also massaged the cheek and neck. After working for about two hours the face and tongue became normal, and I could open my mouth." I hope I may never again have a similar experience.

I would like to have the opinions of some of the profession, as to the probable cause of this trouble.—*Homer Heberling, The Garretsonian.*

TWO USEFUL METHODS.

In acute pulpitis without exposure wash out the cavity and dry it. Apply a pledget of cotton with oil of cinnamon or oil of geranium. Heat a ball burnisher to red heat or nearly so, and apply it to the cotton pledget a sufficient length of time to cause evaporation of part of the oil.

Remove the dressing and apply gutta percha. Repeat every two or three days till the tooth is quite comfortable, then fill as usual.

An easy method of disinfecting a tooth with a dead pulp and to reduce severe pain of inflammation due to acute periodontitis—when the pulp chamber and canals are not filled, consist of the following:

Wash out the cavity and dry it. Saturate a pledget of cotton with tincture of iodine and apply to it a large ball burnisher made quite red hot. This will cause the vapor of the iodine to permeate the root canals, and if applied three times a day should reduce the acute pain and reduce the inflammatory process if this be not too far advanced.

The same process can be used to disinfect roots, before opening, then by adding a very small quantity of formaldehyde solution to the iodine.—*Edward Dunn, Garretsonian.*

PRACTICAL PROSTHETIC CASTINGS

BY F. EWING ROACH, D.D.S., CHICAGO, ILL.

Read before First District Dental Society of New York, February 5, 1912.

FROM a scientific viewpoint the subject of dental casting has been pretty thoroughly covered. The general technique is now quite familiar to all. The behavior and manipulation of waxes and investment compounds have been well discussed and, to most of us, this phase of the subject seems to be sufficiently well understood to warrant a feeling of satisfaction, so there seems to be but little need of directing your attention to this feature at present. But when we come to the construction of the great variety of prosthetic pieces we are confronted with a very different proposition.

A careful study of the situation has convinced the writer that the profession at large has not made the most of the casting process in prosthetic procedures. Dr. E. G. Coolidge, of Chicago, has just completed a canvass of the members of the Illinois State Dental Society and he reports some interesting data regarding the status of the cast gold inlay in our state. He found that an average of 58 per cent. of the profession are using gold inlays, as against 42 per cent. who are using foil fillings. Similar data secured by your essayist show that a very much smaller per cent. have adapted the casting process to their prosthetic work. And while this splendid means of constructing our prosthetic pieces, such as crowns, bridges, splints, partial plates, etc., is far superior in many respects to all other methods, its advantages have, nevertheless, been overlooked by the great majority of the profession.

In my opinion all prosthetic pieces except the full denture can be made quicker and better by casting than in any other way. And when we say better, we mean more accurate adaptation and anatomical reproduction, with greater facility and equal strength. The limitations of casting to this class of our work are the limitations of the dentist himself and not of the process.

Certain inherent physical difficulties surround the fitting and shaping of metals to the many intricate and irregular surfaces of the teeth and mouth by the swaging method that do not present themselves with the casting process. With castings it is a question of technique only.

If the profession have not made use of castings in their pros-

thetic work to the same extent that they have for inlays, the question naturally arises, Why is this the case?

There are several factors that contribute to this condition. For a number of years prior to the introduction of the casting process we had studied the question of cavity preparation for inlays; and the permanency, as well as the many other questions regarding the inlay method of filling teeth, had been quite satisfactorily and favorably settled, so that we were in a very receptive mood, if you please, for the cast inlay. It came at a time when the whole dental world was ready to grasp it and make practical use of it at once. Had it been given to us ten or fifteen years earlier it would not have reached the same degree of popularity that it did in so short a time.

The variation in inlay technique, brought about by the casting process, was practically only a step, and that a very much simplified step, too, while in prosthetic procedures we have had to make many, many changes in the details of our construction. We are constantly changing and improving our methods of doing this, that, or the other thing until, under the new régime, we will eventually arrive at the one best way of doing them all.

No two cases, of course, will call for exactly the same treatment, but similar methods will be followed for a certain class of cases. Our cases will be classified and our work systemized so that we will have a generally accepted method of doing each class. There is need for a better understanding of the difference in the physical characteristics of *rolled* or *drawn* metals from those of the castings. We very frequently see bridges and partial plates made of what I would term junk gold, using all the old crowns, bridges and the like, that accumulate in the office by melting them all together and without refining, cast them into some practical piece. This is a practice that cannot be too strongly condemned. Such castings are brittle and unless in large masses, will not withstand the strain that is likely to be brought to bear upon them.

An examination of the exhibits at the meeting of the Institute of Dental Pedagogics, in Chicago, last week, revealed the fact that the teaching of this subject is very meager. The prevailing objections to the teaching of casting methods in the dental schools were that the student did not get the required training in finger craft, and that the cost of materials was so much greater, that the management of the schools would not stand for the extra expense. Knowing that neither of these excuses occupied tenable ground, I made sufficient inquiry to satisfy myself that the teachers themselves had not worked out a system of technique in casting that

they could offer as a substitute for the old methods. This should not be. The student should be taught modern, up-to-date dentistry. The methods in vogue five years ago are obsolete now, and it is an injustice to ourselves, and an imposition upon the public if we do not adapt this wonderful process to our prosthetic work.

It is a surprise to me to find so many who are still fitting bands, backing facings, and soldering them together; making the old two-piece gold crown with swaged cusps; bridges with dummies backed up and soldered individually to a swaged cusp to be subsequently assembled and soldered together. But we must expect that any radical change from the good old way will be made by most people in all walks of life very slowly, the dentist not excepted.

After all, the change is not so radical. It is more in learning to manipulate wax than anything else. Tooth and root preparation are practically the same. Taking impressions and making models are unchanged. It is simply a question of technique, and for that reason you will pardon me for spending considerable time and emphasizing details of construction.

We will take up first the construction of the cast base porcelain crown, the principles of which many of you are familiar with. In supplying a substitute for the natural tooth we should select methods and material that possess the greatest possibilities of reproducing the natural organ in appearance, strength and utility.

The successful crown should fulfill the following requirements: Good adaptation to root with reference to peripheral continuity and apposition to end of root; freedom from peridental impingement; close contact with approximating teeth, and at the same time preserving interproximate space gingivally; correct occlusion, anatomical alignment with adjacent teeth, adequate strength and compliance with the cosmetic requirements.

As I have discussed fully, in another paper, the shortcomings of the various crowns that are in general use to-day, suffice to say at this time in this connection, that the cast base crown in my opinion, all things considered, stands at the head of the list for the ten anterior teeth.

The technique of this crown is as follows: Trim root to gum, enlarge canal for suitable dowel, enlarging or extending orifice of canal labially and lingually, avoiding as much as possible weakening root by mesio-distal cutting. With the Universal facer the root is trimmed off labially below the gum by giving the facer a sweeping motion. The lingual interlocking step is now made by placing point of the flexible guard pin of facer into canal and forcing facer back until cutting edge is in line with lingual periphery of root; then by holding it in one position, the lingual surface is cut down, leaving the inner portion standing. A groove is cut from orifice of canal to

labial surface, the object of which is the reinforcement of wax at this point while fitting. It also adds stability to crown when set. Select any loose pin crown suitable for the case, grind to approximately fit root and grind off linguo-gingival angle. Fit dowel to canal, allowing it to project just enough so that it will reach bottom of hole in crown when labial end of same just touches end of root, thus determining exact length of dowel. Iridio-platinum wire 13 gauge threaded is preferred, but clasp gold may be employed. The dowel is heated and forced through a cone of inlay wax. Crown is placed over end of dowel, wax softened over flame while being held between fingers to prevent overheating, and when soft forced partly to place on root, remove, trim off excess wax. Repeat the above procedure until crown is fully seated, a perfect imprint of end of root is obtained in the wax, and excess of wax is trimmed to peripheral outline of both tooth and root, and sprue attached lingually. The crown is removed and the dowel with wax base pattern invested and cast preferable in 24-k. gold.

PORCELAIN-FACED DOWEL CROWN.

While the porcelain-faced form of crown is seldom necessary, there are cases where it may be employed advantageously. The technique for this form of crown is as follows: Prepare root, fit band and dowel as for the usual construction, grind and fit facing in the mouth. The dowel is now removed and hammered flat on projecting end until wider than distance between facing pins. With knife-edge stone, file or plate punch make notches to correspond with pins. Facing and dowel in this relation are replaced in the mouth to verify the length of dowel, after which the dowel is threaded, heated and forced through a cone of inlay wax. Soften the cone of wax now, adjust facing and dowel with wax cone and force them to place on the root, having band in place at the time. Chill the wax now, adjust facing and dowel with wax cone and force them to place on the root, having band in place at the time. Chill the wax and remove all parts together by passing an instrument under the band and working off carefully from side to side so as not to disarrange the parts. Trim off excess, remove facing, put carbon points in pin holes, and you are ready to cast and finish in your favorite way.

For this class of work there is no objection to the use of scrap and junk gold for the casting—preference is given iridio-platinum for dowel and 22 or 24-k. gold for band. The facing pins may be bent down at an angle for 45° or 50° in cases of close bite and the Lingual Hood cast.

GOLD CROWN.

There are a few that have adopted the cast cusp gold crown, but the technique of this crown is so little understood that its advantages over all other methods of construction are not appreciated. To my way of thinking, there is no other procedure that compares with it in any respect. The facility with which contour and occlusion may be produced is a marvel of simplicity and accuracy.

We frequently hear the claim made that this crown requires too much gold to permit of its general use. This objection I am prepared to prove is not correct. The technique of this crown is simple, quick and accurate, and needs but a few words to explain.

With tooth properly prepared, the band is fitted in the usual manner and contoured with pliers. Band should be made long enough so that it may be cut and fitted to approximate the occlusion. A cone of inlay wax is now softened and placed over occlusal end of band and patient instructed to close upon it. Chill the wax, remove together with the band, ~~carve to anatomical form indicated,~~ and with Suction Wax Carver ~~remove any excess~~ of wax from inside of crown. For this purpose I prefer the more transparent waxes so that the thickness may be more readily determined by holding up to the light while carving. Scrap and junk gold may be used for this class of work to better advantage than for any other purpose.

SPLIT ROOT.

While the casting process has completely revolutionized all my prosthetic and operative procedures in everyday routine work, it has at the same time enlarged the field of reparative measures so that operations heretofore practically impossible of satisfactory accomplishment have become commonplace and simple, with results beyond our fondest hopes. As an illustration of this I am going to give you a description of a method of repairing split roots that has given me great satisfaction.

If our good friend Taggart had done nothing more than made possible the restoration to comfort and usefulness of teeth with split roots he would have rendered a great service to humanity. And while this operation is only one of many, it is unique in character and shows the possibilities of the process.

When a case presents itself with root fractured not more than one-half its length and the fractured piece is intact the repair is simple and positive. The procedure is as follows: Draw fractured part into close apposition by twisting wire around it. The steps outlined above for cast base crown are identical, so that when wax base is secured the piece of root is extracted and carefully placed in

position on wax base—the groove across end of fractured piece and the side of canal affords a definite guide in locating it. The piece is now secured to the crown and wax base with wax. The fractured surface and dowel is coated with a vegetable oil and a batch of cement, mixed stiff, is pressed into apposition with fractured surface of root. When cement is hard it is scraped down flush with piece of root, after which it is separated from crown and piece of root. Piece of root is carefully separated from wax base and crown with wax base readjusted to its proper position on cement model, and inlay wax melted into space originally occupied by piece of root and scraped down flush with surface of cement model. This gives us an exact reproduction in wax of the piece of root, united as an integral part of the original wax base in its proper relative position, which is also true of the casting. When cementing such a crown to place in the mouth I prefer to use Evans' gutta percha cement on fractured surface.

In my experience with casting I have made the following observations:

That nearly all prosthetic castings should be made in combination with iridio-platinum or gold in wire or plate form as means of reinforcement.

That iridio-platinum on account of its great strength and freedom from oxidation affords the best reinforcement.

That 24-k. gold reinforced with iridio-platinum is the best for inlay abutments.

That the reinforcement plan expedites as well as strengthens the work and obviates bulkiness, which is so essential in many instances.

That it is best not to heat any alloy of gold containing base metals to the point of oxidation when casting upon it.

That it is unnecessary and detrimental to heat a flask to a red heat or anywhere near it when burning out wax.

That the elastic limit of scrap or junk gold is practically nil and it should not be used where much strain will be brought to bear upon it.

That alloys of gold with platinum will become very brittle when cast a few times. This Dr. Taggart tells us is due to contamination with silica contained in the investment.

That the casting process makes possible the employment of almost all forms of porcelain teeth and that provision should be made for cementation rather than casting directly on to the porcelain.

That nearly all inlay abutments, regardless of size and shape of cavity, should have some form of supplemental pin anchorage.

DISCUSSION.

Dr. F. T. Van Woert.—It has been a very great pleasure for me to be present and listen to so excellent a paper from the pen of so noted and able an author. It is an evidence of his usual careful and scientific investigation. At the same time, it is equally strong evidence that the subject is only in its infancy and will require a great deal more of careful investigation to bring it to anything like the perfection for its adoption in general prosthetic work. It is unfortunate that many members accept the deductions of prominent writers and make no allowance for the application to their individual cases, which results often in failure, and condemnation of the method, followed by loss of faith in the author. This condition is frequently brought about by the author himself, in his effort to meet the demands of the varying conditions of the members, rather than that of the subject to whom the art is to be applied. For example, the present author condemns in the early part of his paper the use of scrap gold for casting and later admits that it may be used. (I have a suspicion that he has made the admission to accommodate a few who think they cannot afford the refined gold and its proper alloy.) Within a few days my attention has been called to a case of this kind by one of my confreres in Brooklyn, who condemned the whole process of casting on the very ground mentioned, and all because of a misinterpretation of what someone had said in the past. My personal clinical experience leads me to believe that either pure gold or a known alloy of the same must be used to obtain satisfactory results. Surely a conglomeration of metals is not to be depended upon, hence should never be used. It is false economy and is sure to cost more in the end than the most expensive material indicated.

Cast Base for Porcelain Crowns.—The cast base as advocated for the anterior teeth crowns is without doubt a great advance in the protection of the root; other than this, little can be said in its favor. Its greatest disadvantage is the difficulty of repair of the porcelain in case of fracture, due to the fact that there are no two crowns from the same mold that are of the same size. This variation in size is due to the unequal pressure under which they are made; therefore, I prefer the hand carved porcelain crown fused on a thin platinum base.

Richmond Crown.—In the Richmond crown very little if anything is to be gained in the casting process, unless said crown is to be used as an abutment for a bridge. In fact, the cases are rare in which the Richmond crown should be used for any other purpose.

GOLD CROWNS.—I am not quite in accord with the author's

technique of making all-gold crowns. First, I find that a short band, say, not more than one-half, preferably less, of the length or height of the crown, permits of the restoration of contour in the wax with more accuracy and in less time. At the present time I know of no argument to combat this, unless possibly it be the claim that an excess of gold is used. This is very easily overcome with the Roach Suction Carver; but a gold crown constructed in either way comes nearer the ideal than anything ever presented before, provided proper gold is used. I have found Ney's gold 22-k. non-oxidized best for the purpose. Sweating the band and using gold that has not been melted more than two or three times is best.

Cast Bridges.—My early experience in this work was rather a sad one. Later, I found by reinforcing with iridio-platinum, as suggested by the author, eminently satisfactory results were obtained; but I feel very much more secure when the union between two or more dummies is strengthened with solder. I do not believe in anchoring bridges to inlays. It seems to me a very impracticable method.

Cast Dentures.—In this I think I have as varied and extensive an experience as almost anyone, unless it is Dr. Taggart, and I find the results far from satisfactory. There is little difficulty in casting a plate, including the clasps, that will fit, and be of an even and suitable thickness; but I have yet to find an alloyed gold which will stand the strain in the average case. There are few cases where the occlusion and formation of the remaining natural teeth are favorable to such a fixture. I mention one case in particular which many of you have seen. A maid in my office wears a cast upper plate of clasp metal and clasped to the third molar on either side, the crowns of which are conical rather than bell shape, so that there is little springing of the clasps and the occlusion is directly upon the ridge posterior of the six front teeth, so there is little or no strain upon the plate, otherwise it would have been broken long ago.

From what I have said it might be inferred that I am depreciating the casting process, but this is furthest from my thoughts. On the contrary, it is to enhance its value and help to bring it into more general use that I have pointed out some of the difficulties which have prejudiced some against it, and to show my appreciation of the great genius, Dr. Taggart, who has given us this most wonderful discovery, and by getting the good and practical results out of it and not making it a farce by a lot of failures.

Dr. Charles F. Ash.—I want to say I take off my hat to the gentleman from the West. In the East, we are only beginning to wake up to the possibilities of this work.

There are a few things in the essayist's paper with which I must differ. I noticed in reading a synopsis of his paper that he said he was surprised to see people still fitting bands, and then he said something to the effect that he was condoning the offence. He has no right to condone the offence. A very strong stand on that point should be taken by every essayist who reads a paper before a dental society on this subject. I do not believe bands have any place in the mouth in the ordinary prosthetic procedure. Something very extraordinary may make it permissible, but I cannot think of any such condition at present.

The essayist also made the remark that he found in making splints, they were apt to be weak at certain points. My own experience with the splints I have made and with all the splints I have ever seen made by anyone else is that they are unnecessarily strong and altogether too bulky. They do not require any great amount of strength to hold the teeth in proper position. I will not dwell on the technique of this work, but simply go hurriedly through a few points.

One point with which I take exception is in regard to the use of scrap gold. No scrap gold should be used in any casting, and no base metal should be used in casting any sort of prosthetic piece.

Another point with which I take exception is in regard to indiscriminate use of inlays as abutments for bridges. I feel, from my own experience, as does Dr. Van Woert, that any bridge carrying more than one dummy, requires more than an inlay to hold it.

In regard to the preparation of the root, I also think that the preparation which most of you know I have advocated for many years is a little more capable of being made positive at the margins. I know it has been criticized by some people, especially by our friend Dr. Chayes, and he will give you some geometry to prove that it is a wrong preparation. The preparation which I advocate is the grinding down to the gingival margin and enlarging the circumference around the post hole. After the preparation is finished there is considerable room around the pin below the surface of the root.

The bridge which was shown on the screen with the hand rail attachment appeals to me as being very unique and clever. He attached a piece of iridio-platinum by extending beyond the line of the cusps. I have frequently incorporated a piece of iridio-platinum in the attachment, but this is entirely new to me and very clever.

Another point is in regard to the cast crown, but inasmuch as the gentleman who, I think, originated the cast gold crown on a platinum shell is to follow me, I feel it is within his province to speak of how to make the cast gold crown.

Dr. Herman E. S. Chayes.—I want to say at the outset that I fully appreciate the skill and the knowledge of the essayist, more so now that I have had the opportunity to see his work and listen to his paper. I agree with him that the profession in general has not made the most of this wonderful process invented by Dr. Taggart. But I do not agree with him when he says that, from a scientific point of view, the subject of dental castings has been thoroughly covered, and further states that the behavior and the manipulation of waxes has been so thoroughly discussed that it is now well understood.

There is no doubt at all that prosthodontic restorations can be more accurately and more artistically made by means of the casting process than by any other method. Whether they can be made in shorter time is no important question. I do not believe they can.

However, the results one obtains are so superior to the old method results that we do not begrudge the additional time it may take.

The real truths about casting, propounded by Dr. Taggart and unquestionably best known to him, have been obscured and blurred and distorted for the majority of the dental profession.

They have been induced to follow erroneous teachings of thieving manufacturers, who attempted not only to discredit the father of this process, but actually made capital out of the credulity of the majority of the dentists.

Two factors enter into the wherefore of this situation. First, our so-called superior business methods of America make it possible for one man to invent a useful process and for his rapacious neighbor to reap a harvest of unearned benefits therefrom, and, second, the unreasonable desire of the average man to obtain something for next to nothing makes him a ready prey for the methods of the same rapacious neighbor.

The men who to-day really know something of casting are using the Taggart machine and the Taggart method, but how many are there in number?

The vast majority are using spurious machines and spurious methods; both the machines and the methods are wrong in principle of construction and hence in results obtained. How, then, can we say that from a scientific view the subject of casting has been well covered and is well understood?

Probably the propounder of every great truth has had the same things to contend with, and in a measure it is a sort of acid test of the real value of an idea.

(To be continued in November issue)

SOCIETY PROCEEDINGS.

THE New Brunswick Dental Society, at its annual meeting in July, decided in favor of a joint Maritime Convention next year. The Society also voted in favor of Moncton as the next place of meeting.

Officers were elected as follows:

President—H. S. Thomson, Moncton.

Vice-President—A. R. Currie, Woodstock.

Secretary-Treasurer—F. A. Godsoe, St. John.

New members of Dental Council for four years—W. P. Broderrick, St. John; W. H. Stevens, Fredericton; J. W. Moore, St. Stephen.

DENTAL DISEASE AND THE MIND.

HPERSON, from a skiagraphic study of the dental conditions of some 350 to 400 patients suffering from mental aberration, is convinced that dental disease among defectives and the insane is often present in a causal relation.

He gives detailed illustrative histories of seven patients, including three adults and four children, in whom recovery from attacks of insanity of various grades, delusions, or mere irritability and nervousness, was brought about by extraction of decayed or impacted teeth and amputation of abscessed roots. Skiagraphic study of the jaws is strongly advised in cases of obscure mental and nervous disorder, even the possession of thirty-two well-placed teeth being no indication that skiagraphs can be dispensed with. The more hopeless mental disorders of childhood and adolescence, *viz.*, imbecility and dementia precox, are among those furnishing the most striking examples of prompt improvement and ultimate recovery through relief of dental lesions; the cases selected, however, should be characterized by aberration, not by extinction of mental power. Incurrigibles, nervous and sleepless children, as well as those with impulsions and obsessions, are well suited for dental therapy. Neither kind nor location of dental lesion determines the type of mental disturbance present, which may include not only mania, melancholia, and other emotional disorders, as well as mental and moral defect in children, but also dementia, as it occurs from adolescence to senility, and paranoid forms of insanity. Absence of pain, moreover, is no proof that a dental lesion is harmless; in fact, upon studying cases, it is evident that the mental and nervous symptoms usually either part company with pain or vary in inverse proportion to it.—*Monthly Cyclopedic and Medical Bulletin (The Dental Cosmos)*.

CORRESPONDENCE.

Ridgetown, Ont., Sept. 18, 1912.

Editor ORAL HEALTH, Toronto:

Is a dental patient 91 years of age anything out of the ordinary? This is the age of a little old lady who came to my office a few days ago to have some dental work done.

She has been wearing a partial lower denture for years, and as the remaining natural teeth were lost one by one she has had artificial substitutes "added" to the original plate. Her visit to me a few days ago was for the purpose of having a couple of artificial teeth attached to the lower denture to replace her last two natural ones—recently lost.

While complaining of the irritation caused by the rather sharp edges of the denture that had formerly fit in around the natural teeth, she said, "You may think I am funny, but when you are 91 years of age you won't be so smart as you are now."

She was a pleasant patient—a little difficult to talk to, having almost entirely lost her faculty of hearing. She came to the office *unattended*.

Will this be of any interest to readers of ORAL HEALTH?

Yours truly,

N. S. COYNE.

St. Thomas, Ont., Sept. 23, 1912.

Editor ORAL HEALTH, Toronto, Ont.:

It is very gratifying to learn through the columns of your valuable magazine that the profession of dentistry have scored another victory in becoming more recognized and closer allied with the medical fraternity, by the Faculty of Medicine of the University of Toronto establishing a Department of Dental Surgery.

Practitioners of dental surgery at the present time should be very grateful to the early pioneers, who labored under many difficulties, who, during their arduous times, saw visions of a greater destiny of their calling and thenceforth hewed the path for a "greater dentistry," so that it has now become recognized by the noble medical fraternity as a calling which not only aids them in their medical treatment, but is of untold blessing in the alleviation of human suffering, for which the public cannot but be grateful.

We have never resented the medical calling, nor have we endeavored to stand aloof from them, for we readily recognized their assistance would eventually strengthen our cause and thus elevate our profession to a standard which we truly deserve.

Those of us who have been for some time in the practice of dentistry can readily recall much we had to contend with and many of the embarrassing difficulties we had to surmount, for the medical fraternity did not hardly recognize our efforts, but repudiated our claim as being in any way associated with their science.

We are glad to know that the medical and the dental professions are becoming more and more closely linked together for a greater good, in the prevention and alleviation of human suffering—for the happiness and betterment of mankind.

We sincerely wish Dr. Mason, the newly-appointed dental surgeon of the department, every success, and hope that he will do credit to the high charge which has been entrusted to him, and show them that we are worthy of the name.

Yours fraternally,

T. C. TRIGGER,
President Elgin Dental Society.

HALF-DOING THINGS.

BY O. S. MARDEN.

THOUSANDS of people are held back all their lives and obliged to accept inferior positions because they cannot entirely overcome the handicap of slipshod habits formed early in life, habits of inaccuracy, of slovenliness, of skipping difficult problems in school, of slurring their work, shirking, or half-doing it.

These skipped points in business or in life, the half-finished jobs, the problems passed over in school, because they were too hard, are sure to return later in life and give endless trouble and mortification.

Half-doing things, "just for now," expecting to finish them later, has ruined many a bright prospect, because it has led to the habit of slighting one's work. "Oh, that's good enough, what's the use of being so awfully particular?" has been the beginning of a lifelong handicap in many a career.

I was much impressed by this motto, which I saw recently in a great institution, "*Where Only the Best is Good Enough.*" What a life motto this would be! How it would revolutionize civilization if everyone were to adopt it and use it; to resolve that, whatever they did only the best they could do would be good enough, would satisfy them!

Adopt it as yours. Hang it up in your bedroom, in your office, or place of business, put it into your pocketbook, weave it into the texture of everything you do, that your life-work may be what everyone's should be—a masterpiece.—*Success Magazine.*

MULTUM IN PARVO.



This Department is Edited by C. A. KENNEDY, D.D.S.

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

Address. C. A. KENNEDY, D.D.S., 2 College Street, Toronto.

WHEN using the hypodermic syringe don't insert the needle straight away. A drop of chloroform applied to the spot first will render even the "prick" imperceptible.

DON'T use the same needle a second time, even for the same patient—you might use the wrong one, and needles are cheaper than law suits.

DON'T use a hypodermic needle without first sterilizing it *yourself*. Fit the needle and then draw up a little alcohol—just a needleful. Pass the needle through the flame of your spirit lamp and you *know* that it is perfectly aseptic.

EVERY TOOTH, which, together with its contiguous soft tissues and supporting and surrounding bony tissues cannot be put into and maintained in a condition of health, absolutely free from flow or exudation of pus or retained infection, should be extracted—*J. H. Crawford, Dental Summary.*

MAKING GOLD FOIL ADHERE TO AN OLD FILLING IN REPAIRING.—The best procedure to make gold foil adhere to an old filling in repairing is as follows: The rubber dam is applied and the filling is carefully wiped with wet cotton, followed by sulfuric ether, in order to remove all traces of fat. The filling is then washed with alcohol and dried with hot air. No. 4 gold foil is well annealed, and, after the old filling has been roughened, the foil is brought into closest contact with the old filling by using the smallest serrated plugger under hard pressure. The new foil is then firmly condensed with the hard mallet.—*Archiv fuer Zahnheilkunde.*

POLISHING AMALGAM FILLINGS.—Plaster as it comes from the flask after vulcanizing a plate is an excellent means for polishing amalgam fillings, after they have been gone over with sandpaper disks.—*G. Brahm, Tandlaegebladet.*

REMOVING THE ODOR OF TOBACCO AND ALCOHOL FROM THE MOUTH.—In order to remove the odor of tobacco and alcohol, the mouth is rinsed thoroughly with one part of 3 per cent. hydrogen dioxid and five parts of rose water.—*Archiv fuer Zahnheilkunde.*

HOW TO MAKE STICKY WAX.—Gum dammer, one part; rosin, one part, and yellow beeswax, four parts, are melted in a water bath, thoroughly mixed and poured into a mold, for which purpose the cover of a tin box may be used. The wax is then rolled into pencil form with wet fingers.—*W. B. Tyrrell, Odontologist.*

METHOD OF DISINFECTING A TOOTH WITH DEAD PULP.—An easy method of disinfecting a tooth with a dead pulp and to reduce severe pain in inflammation due to acute periodontitis when the pulp chamber and canals are not filled consists of the following: The cavity is washed out and dried. A pledget of cotton is saturated with tincture of iodine, and to it a large ball burnisher made quite red hot is applied. This will cause the vapour of the iodine to permeate the root canals, and if applied three times a day should reduce the acute pain and also stay the inflammatory process, if this has not advanced too far. The same method can be used to disinfect roots before opening, adding a very small quantity of formaldehyde solution to the iodine.—*E. Dunn, the Garretsonian.*

THE CARE OF WOMEN'S TEETH DURING PREGNANCY.—The time has passed when it is considered necessary that women should suffer from toothache during pregnancy. It has long been taught that relations between the teeth and the impregnated uterus are so intimate that each must suffer from the faults of the other. It is an old saying: "For every child a tooth."

Almost every expectant mother thinks that an extraction is very apt to cause a premature delivery. Consequently they suffer on through pregnancy, allowing their teeth to be neglected until, by the time they find it convenient to visit their dentist, some of their teeth are so far gone that extraction of one or more becomes necessary.

It is the duty of every dentist to relieve pain and not to cause it. Every woman who finds herself pregnant, should visit her dentist, tell him her condition and place herself in his hands to do whatever work he finds necessary to be done. We should take special care to avoid giving her pain at such a time, not because it would be hazardous, but because of the necessity of not shocking her nerves any more than possible. Any cavities that are liable to cause pain before the woman's delivery should be filled. Other teeth that are too bad to save should be extracted. If an anesthetic is necessary, her attending physician should be called to administer it.

If from the skillful and careful performance of any necessary operations on the teeth, any harm has ever been done the prospective mother or her unborn child, there has never been a record made of it.—*J. C. Winters, Dental Review.*

REMOVING TEETH FROM OLD VULCANITE PLATES.—A simple method for removing teeth from old vulcanite plate consists in investing the plate with sand in a flask or any iron vessel and setting it into a burning stove. The fumes of the burning rubber will escape through the chimney. The charred rubber can easily be removed from the teeth with a stiff brush.—*Archiv fuer Zahn-heilkunde.*

PROTECTING SOFT TISSUES IN POLISHING FILLINGS OR GRINDING NATURAL TEETH.—When polishing a filling or using a stone in the mouth, a sterilized teaspoon can be used instead of a mirror to protect the soft tissues.—*Dental Brief.*

RESTORING CLOGGED CARBORUNDUM WHEELS.—In order to restore clogged carborundum wheels which have become dull and useless, after polishing amalgam fillings, the wheels are immersed into a fifty per cent. nitric acid solution for two or three hours, and then transferred into a bath of concentrated sodium bicarbonate solution, in which they are left until the acid absorbed by the wheel has been neutralized.—*Revue Trimestrielle Belge de Stomatologie.*

Occlusion, functionally considered, is the position of the dental machine at the end of the working stroke.

Occlusion, normal or abnormal, is that relationship in position between upper and lower teeth which exists when, on bringing the jaws into closest approximation, both condyles have come to rest at the posterior functional limits of their paths.

Occlusion is the actually existing relationship between normal and abnormal opposing teeth during a particular relationship of the jaws.—*D. M. Shaw, The Dental Record.*

AN IDEAL ANTISEPTIC.—My ideal of an antiseptic is an agent that acts only as an antiseptic; an agent that will inhibit the growth of bacteria and at the same time will stimulate the activity of the animal cell, thus promoting phagocytosis.—*J. P. Buckley, Chicago.*

ORAL HYGIENE DURING TYPHOID FEVER.—During typhoid fever the oral and the nasal cavities demand special care. The tongue, which is usually very dry, is wetted with a mixture of equal parts of glycerin and vichy water to soften the crusts and exudates, and these are then easily removed with a soft tooth brush and a tongue sealer, consisting of a flat whalebone or a celluloid strip. The gums and the gingival interstices are cleansed with cotton tampons dipped in the same solution and together with the teeth are brushed with a soft brush. This cleansing process is extended to the pharynx and the nasal fossae and repeated three or four times each day. The patient should never be allowed to drink anything before this cleansing has been applied, in order to prevent the ingestion of septic matter.—*Revue des Hopitaur, per Revue de Stomatologie.*

ORAL HEALTH.

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A Monthly Journal devoted to the interests of the Dental Profession, and to the furtherance of Public Health through the education of the Public in relation to Oral Hygiene.

Published in the hope that it may reach those with an open mind, a willing heart and a ready hand to serve.

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EDITORIAL.

MODERN DENTISTRY AND PUBLIC HEALTH.

PUBLIC health problems are receiving more attention to-day, both from press and statesmen, than at any previous time in the world's history. Departments of health have at last passed through the stage of being considered a mere adjunct to departmental government—a necessary bit of formality maintained for the purpose of satisfying a few antiseptic cranks in the community.

To-day, in civilized communities, health problems are assuming a position of first importance in public assemblies and discussions. When a parliamentary representative talks "Public Health," both front and back benchers sit up and give keen attention. Not many years ago such a talk would have been looked upon as more or less academic, and suitable material for the Government printer to publish in pamphlet for distribution among the members' constituents as a good sample of oratory. Public health was not then a live question of practical politics. To-day it is such—a real live practical question demanding and receiving the earnest attention of public men from one end of the country to the other.

* * * * *

The oral hygiene campaign is essentially part of this general public health movement. The part played by the dental profession in any educational work ought to be of such a character and so organized that the work will gradually and naturally be assumed

by those whose business it is to further public health. *Any organization for dental educational work that is planning for the perpetuation of the movement, as a movement among dentists, is not planning in the best interests of either the public or dental profession.*

* * * * *

As a profession we should stimulate among our members a greater interest in public health problems that we may more clearly appreciate the part the dental profession must of necessity play in their proper solution.

A dentist in his daily practice is individually playing an important part in the maintenance of public health, just as surely as the government officer, the hospital or the medical practitioner is doing. If the dentist is filling cavities at so much per hour, and failing to grasp the larger significance of his work, his practice will surely narrow him and limit his growth. If upon the other hand he appreciates the importance of his daily work and has a vision of the part he plays in the larger problems of public health his work will be a pleasure and an inspiration—it will enlarge his vision and ennoble his life.

COLLEGE ATHLETICS.

THE general tendency in athletics to-day is unfortunately toward specialization and professionalism.

College athletics, it is true, have withstood these tendencies fairly well; yet it cannot be denied that objectionable practices seem to creep insidiously into college sports.

The most pronounced symptom of athletic deterioration is the growing inclination among students to "play the game" on the sideline. Some men never play the game any other way. Others attend practice faithfully until the team is chosen, when, upon failing to catch the committee's eye, they retire in good order to the grand stand.

The real object of college athletics is to encourage every undergraduate to regularly and systematically engage in some form of physical exercise. If specialization for the purpose of winning inter-college contests, interferes with the general participation by students in college athletics, the sooner specialization ceases the better. Have a first team by all means, but let it be a natural result rather than a forced growth.

The entire student body should engage in some form of physical development—all in moderation, none to excess. Then and then only will athletics assume their proper place among the activities of student life.

DENTAL INSPECTION IN GUELPH.

THE Guelph Dental Society are to be congratulated upon their energetic movement for the betterment of mouth conditions among the school children of Guelph. The *Guelph Herald*, reporting the last meeting of the Board of Education, gives the following account of the offer of the Dental Society and of its acceptance by the Board:

“The most important matter which has been brought before the Board of Education of Guelph was broached at their first meeting since the summer vacation, held in the Council chamber. This was the subject of dental inspection of the teeth of the children of the smaller classes of the public schools. Dr. Foster addressed the Board at some length regarding the subject, and made, on behalf of the dentists of the city, a most liberal offer to instruct the pupils in the care of the teeth and also to treat them, in so far as to relieve them from temporary pain at least, free of charge. The offer from the dentists of Guelph was eagerly accepted by the Board, and a hearty vote of thanks was tendered Dr. Foster and the other members of his profession for their most generous offer.

“The question of medical inspection of the schools was also brought to the attention of the Board, and it was suggested that this matter might also be considered by one of the committees, but action only was taken in the matter of dental instruction. The first experiments along this line will take place in St. Patrick's Ward School in the near future. There will be no expense to the Board, everything necessary for the work being given freely by the dentists. The idea is in this manner to bring the care of children's teeth more to the attention of the parents, and prevent the spread of disease among the children. This is certainly a great innovation in the schools of Guelph, and the result will, no doubt, be watched with great interest.

“Dr. Foster quoted some very interesting figures from the reports of four classes in the Guelph schools, which showed great neglect. In one class of 45, where the average age was 7 years, but 20 used a tooth brush, 17 of whom used their own, and 3 used others. In another class of 47, where the average age was 9 years, but 18 used a tooth brush at all, and 14 used their own, 4 using those of others. In a class of 49, with the average age 6 years, but 15 used a tooth brush, 4 used a rag and 2 used others' tooth brushes. In another room of 43, average age 9 years, only 7 used a tooth brush, 17 used a rag and 8 used the brushes of others.

"He stated that a number of the city dentists were willing to do this work voluntarily, and in this way the parent could be reached. There was no desire to interfere with the private affairs of the parents, but it was only for the good of the pupils."

The *Guelph Herald* of the same issue also contained a very able editorial on the subject of Dental Inspection. Such intelligent support from the press is of valuable assistance. It is to be hoped that this movement in Guelph will be but the beginning of a complete system of medical inspection.

THE FORSYTH DENTAL INFIRMARY CORNER-STONE LAID.

THE corner-stone of the Forsyth Dental Infirmary for Children, Boston, was laid June 5th, 1912. The building will be the only one of its kind in the world and will be completed about May 1, 1913, at a total cost of \$600,000.

The stone was laid by John Hamilton Forsyth, one of the donors of the building. In it were placed a Bible and prayer book, photographs of the Forsyth family, plans of the infirmary, money of the latest issue, orthodontic models, invitations to the ceremony, daily papers, and dental magazines.

The object of the gift of the Infirmary, as stated by Mr. Forsyth, is to bring about a stronger and healthier generation of children by starting with the care of the temporary teeth. The care of the tonsils and treatment of adenoids will also be a charge on the Infirmary.

Following an Invocation by Bishop Lawrence, Mayor Fitzgerald spoke of the need and purpose of the building and praised its donors for their public spirit in making such a generous contribution to Boston. He declared that recent examination of school children had shown serious dental defects to be common and that the infirmary would do much to eliminate such a condition in the future.

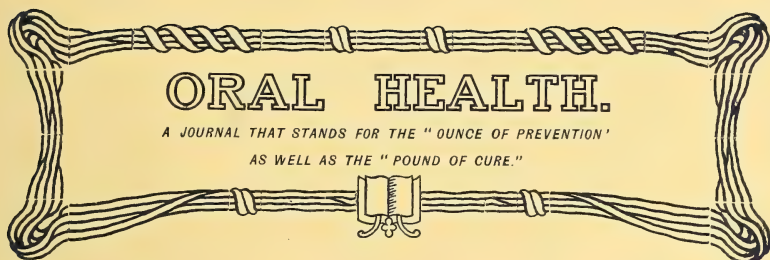
FINED \$50.00 AND COSTS FOR ILLEGAL PRACTICE.

ON 19th September, 1912, Mr. W. A. Silk was fined in the Toronto Police Court for practising dentistry without a license in the office of his brother, the latter being a licentiate of dental surgery.

At the same sitting of the court a case against a dental student who had worked in the same office and who had failed to protect himself by registering indentures with the proper official, was withdrawn, the defendant having paid \$20.00 into court.

DENTAL PRACTICE FOR SALE.

In Western Saskatchewan town. Did \$4,000 last year. Easy terms. Best of reasons for selling. For full particulars apply Box 25, *Oral Health*.



Vol. 2 TORONTO, NOVEMBER, 1912. No. 11.

THE FORMATION AND ANALYSIS OF DENTAL AMALGAM ALLOYS.

BY HAROLD E. KLINGNER, L.D.S., D.D.S.

Professor of Metallurgy and Analytical Chemistry, Department of Chemistry, of the Royal College of Dental Surgeons.

[In this article Dr. Klingner outlines approved methods for analyzing dental alloys. The alloys referred to are three of the alloys more generally used in dental practice to-day. The article is published because of its scientific value and as an interesting study in the balancing of Dental alloys. Note the relative quantities of each metal in the three samples. Practitioners desiring the trade names of the alloys tested will be supplied same upon request.—*Editor.*]

AS the title suggests, this paper lays no claim whatever to be a treatise on dental-amalgams as to their ability to conserve tooth tissue, nor as to their manipulation, but is simply an analysis of several of the so-called high-grade dental-amalgam alloys that are offered on the market, with a few introductory remarks as to their formation.

Scientific investigators have demonstrated and shown quite clearly that under the same conditions and with the same methods of procedure the same results can be obtained, thus eliminating the field of chance.

In the formation of a dental-amalgam alloy it is quite obvious that to obtain certain definite results correct percentages of different metals must be employed. Students of metallurgy, after much research, observed that an alloy of definite proportions of tin, silver,

copper and zinc produced the best results when the opposing physical properties of these metals were properly balanced.

An alloy may be either a solution of one metal in another; a chemical combination; a mechanical mixture, or a solution or mixture of two or all of the above. This combination of the metals in the molten condition must be complete, that is, that every individual c.c. must contain the same percentage of the ingredients of the alloy as the whole. If this solution is not complete a perfect balance cannot be obtained on the addition of mercury to the dental-amalgam alloy; thus the physical properties of the amalgam would be altered.

In order to obtain this complete solution of the metals, and to insure that the proportions added are not changed by oxidation, volatilization, etc., the dental-amalgam alloy is formed in a closed crucible, surrounded by an atmosphere of hydrogen. The heat is carefully regulated, as overheating would cause the formation of eutectic alloys; this means that there would be present in the same mass two or more alloys or eutections differing in fusing points and percentages of composition.

As the degree of fineness of metals varies, it follows that there would be a slight variation in the proportions used in order to obtain the exact percentages. Thus, in the formation of an exact alloy, there could be no set formula; the formula being determined by balancing and annealing at an exactly determined degree of heat. This, of course, could only be arrived at by experiment, in order that the correct expansion of the alloy take place when the mercury is added.

The placing of a dental-amalgam in a dynamometer and registering the number of pounds pressure it will withstand before final dissolution is no test as to the stability of an amalgam. Most all dental-amalgams, when mixed with the proper proportion of mercury, can be subjected to great stress before giving way. The important tests are those of determining the flow and the expansion or contraction. These are realized by the attachment of a micrometer to the dynamometer and a micrometer alone and the results checked by the use of a binocular microscope, with which one can see the actual change which has taken place.

The most important component of a dental-amalgam alloy is silver, and is therefore present in the largest percentage. The tin is next, and the copper and zinc are added as modifiers of the physical properties.

An analysis after the following method, of several of the high-grade alloys, revealed the following percentages of the above-mentioned metals.

A definite weight of each alloy was taken and placed in labelled flasks, to which 50 per cent. nitric acid was added through a funnel; great care was taken to prevent loss by squirting. A gentle heat was added, and the action continued briskly till the alloy was all dissolved, a white powder (metastannic acid) only being left at the bottom of the flask. The supernatant liquid was decanted off and the residues washed with distilled water, and the washings added to the liquids. The residues were dried in a steam oven and the metastannic acid ($\text{H}_{10}\text{Sn}_5\text{O}_{15}$), calcined at a red heat, was rendered anhydrous and in this form weighed.

The weight of the SnO_2 was then multiplied by the factor $\text{SnO}_2=1: \text{Sn}=0.78666$, and the amount of tin present obtained and the percentage present in the alloy estimated.

A	27.15 per cent.
B	27.25 per cent.
C	27.15 per cent.

The excess of acid was now gotten rid of by gently boiling the solutions. The liquids were then diluted with water and filtered into beakers; the flasks and funnels in each case being thoroughly rinsed with distilled water, so that the whole of each solution was transferred without loss.

The silver was then precipitated as silver chloride by means of dilute hydrochloric acid, which was gradually added with continuous stirring until the precipitation was complete. The mixtures were then heated nearly to boiling point and then filtered, the residues being washed several times and the washings added to their respective filtrates. The precipitates were then placed in a steam oven to dry.

The dry precipitates were detached from the papers as thoroughly as possible and transferred to porcelain crucibles, which with their lids had been previously heated and weighed. The papers were then folded up and separately incinerated, care being taken to prevent the Ag. cl. or reduced Ag. coming in contact with the platinum coil.

The filter ashes were now deposited on the inverted lid of their respective crucibles, where each ash was now moistened with a single drop of strong nitric acid, allowed to fall upon it by means of a pipette. The reduced silver thereby becoming converted into the nitrate. Using a similar pipette, a single drop of hydrochloric acid was added, which reproduced silver chloride. The crucible lids were now cautiously heated upon pipe clay triangles by means of small flames placed at considerable distances below them, until

the acids were completely evaporated.

Each crucible was now gently heated until the precipitate just began to melt, when it was removed, along with its lid, to the dessicator and weighed when cold.

The weight of the crucible in each case was now subtracted and the weight of the silver chloride obtained. Multiplying this weight by the factor: $\text{Ag. cl.}=1$; $\text{Ag.}=0.75202$, the weight of the metallic silver is obtained and the percentage present in the alloy is estimated.

A	67.00 per cent.
B	66.55 per cent.
C	65.90 per cent.

To the silver filtrates a little hydrochloric acid was now added and sulphuretted hydrogen then passed through until the precipitation was complete. The precipitates were at once filtered, the funnels being covered with glass to prevent atmospheric oxidation of the copper sulphide into copper sulphate, which would pass into solution and be lost. In each case the precipitate was washed down into the apex of the filter with warm sulphuretted hydrogen water and the acid present thoroughly washed out with the warmed sulphuretted hydrogen water. The filters were then placed in a steam oven to dry.

The dry precipitates were detached from the filters and placed in porcelain crucibles with perforated lids, through which a porcelain tube was passed, and through this tube hydrogen was introduced so that the contents of the crucibles could be heated in an atmosphere of this gas. It is necessary that these crucibles be previously heated and weighed. The papers were incinerated in the usual way, and added to the precipitate. Powdered re-distilled sulphur was placed in each crucible, and a gentle stream of dry hydrogen allowed to flow through the porcelain tubes. The sulphur was nearly all burnt off by a gentle heat, and then the temperature raised to a bright red heat and maintained at this point for about ten minutes. The apparatus was then allowed to cool, with the hydrogen still passing through it, and when nearly cold was removed to a dessicator, and on becoming quite cold, weighed.

The weight of the cuprous sulphide (Cu_2S) is multiplied by the factor $\text{Cu}_2\text{S}=1$; $\text{Cu}_2=0.79823$, and the amount of copper determined and the percentage present in the alloy estimated.

A	4.90 per cent.
B	5.05 per cent.
C	5.25 per cent.

The copper filtrates were now boiled to expel the sulphuretted hydrogen and ammonium chloride was added. Colorless ammonium sulphide was now introduced until the precipitation of the zinc was complete, the mixture being boiled for a short time hastened the settling, the zinc coagulating. The precipitate was now thoroughly washed with hot water containing ammonium sulphide until the filtrate was free from sulphates. The precipitates were dried in a steam oven, after which they were transferred to Rose's crucibles. The filters were incinerated in the usual way and the ashes added to the precipitates. A little re-distilled powdered sulphur was sprinkled into each crucible, and a gentle stream of hydrogen passed into the apparatus. The same technic being used as in the case of the copper.

The zinc sulphide was weighed and multiplied by the factor $ZnS=1: Zn=0.6701$, the weight of the metallic zinc being obtained and the percentage present in the alloy was estimated.

A	1.10 per cent.
B	0.90 per cent.
C	1.55 per cent.

HARRIETT N. LOWELL SOCIETY FOR DENTAL RESEARCH.—The reception given annually to the student body by the administrative board of the Harvard Dental School was made recently the occasion for the launching of a new society that has all the prospects of great importance in the development of modern dentistry. At the reception there were addresses by Dr. Theobald Smith and Dr. Frank B. Mallory of the Harvard Medical School, and by Dr. L. M. S. Miner, of the Harvard Dental School, the motives of which were phases of the questions of individual and allied research work in medicine and dentistry and an immediate outcome of the meeting was the organization of the Harriet N. Lowell Society for Dental Research, an addition to existing societies and one that is intended to emphasize the scientific aspect of dentistry and the close relation between the dentist and the physician.—*Public Health Journal*.

SCHOOL NURSING IN TORONTO, CANADA*

BY LINA L. ROGERS, R.N.,

Superintendent School Nurses, Toronto.

THE Board of Education of Toronto, Canada, began medical inspection of its Public Schools in April, 1910, and asked the writer to organize a School Nursing Service. The first step taken was to locate the schools, beginning with those in the poorer localities; to visit all the hospitals, dispensaries, and relief societies; to find out where assistance could be obtained, and at the same time to explain what the object of the work was. This interested many groups of people, and when the nurses started work they were cheerfully welcomed. A course of treatment was submitted which was adopted by the Board. In May two nurses were appointed and twelve schools, with an attendance of 6,457 children, were visited regularly each day.

There being no Medical Inspectors at this time, the nurses made class room inspections each week. This was done in the following manner. The nurse, after knocking, entered the room and enquired if it were convenient to have the class inspected. She stood with her back to a window, having the children pass in front of her one row at a time. As each child came forward he was requested to hold out his hands, palms upwards, so that any desquamation might be seen, then to pull down the eyelids to note whether granulations or other forms of conjunctivitis was present. At the same time the backs of the hands were inspected. The mouth was then opened for examination of teeth and throat. Finally the head was turned to either side to see if the neck, ears and hair were in any way infected. All this was done quietly and quickly, the child unaware of any disease being discovered. Where any defect was found it was noted. A class card used for this purpose gives a record of the name of the teacher, the room and class, the name, age and address and disease (in code) of the child. A record is also kept on the back of the class card of the date of inspection and the number examined. This routine examination takes about 8 or 10 minutes for a class of 50 children.

*Read in Cologne, Germany, August 7th, 1912.

After all had been examined the nurse went on to the next room. When all inspections for the morning had been made, the nurse prepared her dressing table in the medical inspection room and sent back to the classes for any children requiring treatment or instruction. Very simple dressings were used—only children who were neglected or very poor were treated in school. After school the nurse visited the homes and explained to the parents the defects found or why the children were sent home, and asked them to see their own physicians if the case required it.

In September of the same year two Medical Inspectors were appointed, and while the nurses continued to make the routine inspections, they sent all cases to the doctors for diagnosis. The principals of the schools sent requests for the service of a nurse, and two more nurses were appointed. This experiment with a Superintendent of Nurses, four assistants, and two Medical Inspectors thoroughly convinced the Board of Education that a complete system of inspection was absolutely necessary, and set about it by appropriating \$23,500 for the following year. In February, 1911, Dr. W. E. Struthers was appointed Chief Medical Inspector, thirteen additional nurses, six Medical Inspectors, and one Dental Inspector were appointed.

The city was divided into districts; the schools, of which there were 80, with an attendance of 45,000 children, were formed into groups, one nurse being assigned to each group and one Medical Inspector to every two groups. In February of the present year the staff of nurses was increased to twenty-five and the Medical Inspectors to eighteen. This necessitated another change of system, and each Medical Inspector was given but one group of schools, with an average of 2,600 children. His duties are to make a complete routine examination of all children after vacation at midsummer, Christmas and Easter. The routine takes about one week, and when this is completed the daily duties consist in making morning inspections, to examine children for exclusion referred by the teacher or nurse; to examine children for re-admission, and to inspect those for diagnosis. When the Medical Inspector has completed his morning inspections in each school the remainder of his time is devoted to making complete physical examinations. The Medical Inspectors' hours are from 9-12 a.m. on school days. The nurses, who are on duty from 9-4, with 1½ hours off for lunch, make all the subsequent class room inspections at intervals of two weeks.

When a class room is reported having two or three cases of scarlet fever, measles, or diphtheria, a daily inspection of the class is made by the nurse until the period of incubation is over.

Each nurse has an average of 1,900 children under her care, but this varies in the different sections of the city.

Considerable time is spent by the nurses in taking children to the dispensaries.

When it is found that the parents are unable, through sickness or otherwise, to take their children to the dispensary, upon a written request, the nurse is allowed to do so for them.

When a child is found with any disease or physical defect a reference card is filled in, stating the reason for referring him, and signed by the nurse. When the Medical Inspector arrives at the school he finds the reference cards left for him by the nurse and sends for the children for examination. He in turn fills in the diagnosis, stating what is to be done with the child. If the nurse is to treat him in school, an indication to that effect is all that is necessary. If the parents are to be notified a card is sent home stating what the defect is and asking to have the attention of the family physician called to it. This card is signed by the principal of the school, before being sent to the parent. If the card is not returned within a stated period the nurse visits the home to find out the reason and to give further explanation if necessary.

If the children are found to have only unclean heads, the nurse gives the child printed instructions in a sealed envelope, to be taken home to the parents, and examines the child regularly until thoroughly clean.

After these cases are disposed of the treatments or dressings are attended to and the children returned to their class rooms as speedily as possible. This is a very important feature of the work, for the nurse can have work done at the dispensary much more quickly and effectively than parents. She can make appointments and keep them, and is not prevented because of home conditions. Possibly the father is dead and the mother has to go to work, or vice versa, or there are a number of small children and the home is too far away from the dispensary to walk, and carfare is not always available for a whole family. These and numerous other difficulties are found in every school in the poorer districts. The nurse follows up these cases and sees that they are finished. She may possibly meet the mother at the dispensary if an operation is found necessary for nose and throat conditions and the mother is timid. Nor does she stop there. She feels that when the child has had his tonsils and adenoids removed that he must be sent to the country or some place where he may get fresh air and nourishment to get him back to normal condition of health.

Children with defective vision are examined at the hospital dispensary and a prescription given by a qualified oculist, and the Board of Education, on the recommendation of the Department of Medical Inspection, provided the glasses for the poor.

Where relief is required for the family, in the form of clothing, the School Board has provided centres in different sections of the city where clothes are given out on the order of the truant officer or the nurses. The supply is kept up by donations or are purchased by the Board of Education.

When the nurse has finished the class room inspections, referred all cases for diagnosis to the Medical Inspectors, and treated or instructed any necessary cases, she receives from the teacher a list of those absent on account of illness. These she visits at the homes to ascertain the nature of their illness. If it is a case of suspected scarlet fever, measles, or diphtheria, she reports it at once to the Medical Inspector, who visits at once and makes the diagnosis, where a physician has not been called in.

If the case proves a positive infectious disease it is reported at once to the health authorities. If not, the child is allowed to return to school when able.

It is during these home visits that the nurse has such splendid opportunity for constructive work. She may find that the whole home is disorganized because the father cannot get work, or she may find one or both parents addicted to drink. There may be illness in the home, or there may be only one parent, and that one struggling for a living for the family. No one in the family knows which way to turn to get the help that is temporarily needed. Many a whole family has been saved by the friendly advice and assistance of a nurse who cares, and they feel that their opportunities and privileges are great.

If we find legal action is necessary to save a child's life by protecting his vision or some other defect, we have a Juvenile Court with a kindly judge at the head of it, who lays down the law to the parents. If it happens to be an insane father who threatens to cut his wife to pieces and with four children clinging to the frightened mother—a case which has actually happened—we can get protection from the Police Inspector. If it is a home too dilapidated and unsanitary to live in, with an adamant landlord threatening to dispossess the family if the rent is not paid, we report it to the health authorities, and it is seen to and better quarters provided as soon as possible.

The great pity of our present system of housing is that the demand for small houses is greater than the supply, and it will be a question of time before we can have the results we are looking for.

A campaign for clean teeth forms a big part of our present inspection work. So few parents realize that teeth decay early and that sometimes a child of seven years has practically lost the most important teeth in his mouth. We urge every child to use a tooth brush, and to overcome any excuse for not having them the Board of Education provides the proper tooth brushes at 10 cents each and tooth paste for 5 cents per tube. This enables every child to obtain its own. The brush is an especially good one, made for the Canadian Oral Prophylactic Association, and obtained through them by the Board of Education, and the paste is prepared in tubes specially for the school children and labelled so.

The nurses are told that it will be a criminal offence if any child from now on loses his "six year molar." We hope before long to eradicate many of the prevalent diseases through the care of the teeth. We know that many cases of tuberculosis have their source of infection in the cavities of the teeth, and who knows how many other diseases are contracted in the same way. Our Dental Inspector visits the schools periodically to extract hopelessly decayed teeth and protruding roots. This is only temporary work until the Municipal Dental Clinic is started. A Dental Exhibit is also arranged for the schools, money for which has been already appropriated. Our whole aim is "prevention," so we are proceeding along the lines of prophylaxis rather than waiting until the disease appears.

This brings us to the question of the proper governing authorities of this system. Since it is educational and all our hope lies in teaching, does it not rightly belong to the great teaching body, "The Board of Education." Much better co-operation is gained, too, by having all teachers under the same administration.

We have, unfortunately, a class of children which have not been so far provided for. These are the feeble-minded. An experiment has been tried in teaching, and it is found that while the backward child can be taught the subjects he is deficient in, the feeble-minded child cannot be taught enough in the Public Schools to enable him to be self-supporting. For these a specially equipped institution with proper guardians is required, so they will not be a menace to the community. Where they will be protected and made happy, and where they will be taught whatever kind of work they seem to be best fitted for.

Our anemic, ill-nourished, poorly developed children are being given special attention at present. Our first Open-air School or Forest School has just been opened. Fifty under-nourished and delicate children are taken every morning to a delightful wooded park which has a large sandy beach on the lake front. The children are given breakfast, dinner and supper, with a lunch between each meal. They are provided with cots and sleep for two hours after the mid-day meal. A teacher is provided, and they are taught for a certain period during the day, those behind their grades being given special attention. The rest of the time is devoted to recreation and play.

A nurse is on duty all day, who keeps a record of the gain and has general supervision of the health of the children. A Medical Inspector visits regularly, and any change in condition is reported to him.

The street railway company has given a special car, which takes the children to the park at 8.30 and leaves at 6.30 every evening. We hope that this experiment will prove so valuable that our large schools will be equipped with open-air classes on the roofs, and which may be carried on all the year round—so that when a child is found in the class room below normal health he may be sent to the open-air class, and with food, rest and fresh air be brought to his normal health and take his place in the grade.

Many children who are otherwise losing valuable school time and health as well, will be saved and educated for the community. We hope to start classes for "Little Mothers" in different school centres ere long. Classes would be held and demonstrations given on the care of infants, special attention being given to the food, bathing and dressing. Instruction would be given for care during the summer months, which are so trying for babies, when infant mortality is so high.

School nursing is in a large measure social service, and it is from the fact that the Board of Education in Toronto has given such able support and has not in any way hindered the service that it stands high in its care of the school children. Toronto has the distinction of being the first city to give a post-graduate course to nurses wishing to supplement their general training by a period of school nursing.

The course is for one month. The nurse taking it goes daily with one of the regular staff, assisting with the work, and being given a certain amount on her own responsibility when she feels confident to work alone.

We are working toward an ideal system of medical inspection in Toronto. Before it can be attained there must be the following:

1st. Legislation that makes the establishment of medical inspection of schools compulsory for all Boards of Education.

2nd. If on examination of children beginning school life, any physical defect or ailment is found, that it will be obligatory for the parent to have that surgical or medical attention which the child requires.

3rd. That there be a dispensary in every large school, where surgical and medical aid can be rendered to the children of the poor, free of charge.

4th. The admission of a child to school should be conditional on being passed by the Medical Inspector and the carrying out of such treatment as he deems necessary.

5th. The Medical Inspection Department must be responsible for the condition of heating, ventilation, cleaning, lighting and seating in all schools.

When the children in our schools have this protection as their right, we can look forward to the closing of the reformatories, jails and many of the hospitals.

We can also hope for a nation in the future that will compare with the ancient Greeks and Romans in point of health and strength.

ARTIFICIAL TEETH NOT A LUXURY.—Artificial teeth are a necessity, not a luxury, and a husband is legally bound to furnish them for his wife if she needs them. This is not the opinion of a medical or humane society, but the solemn verdict of the Supreme Court of Wisconsin. Unless an appeal is taken to the United States Supreme Court on the ground that this decision deprives the husband of life, liberty or property without due process of law and therefore unconstitutional, this pronouncement will stand as the law of the land. It is doubtful if there is any other state which has thus safeguarded the rights of its feminine citizens. Married women in need of teeth should at once move to Wisconsin.—*Journal of American Medical Association.*

EXTENDING THE FIELD OF DENTISTRY.

HOW CAN THE SCHOOLS EDUCATE A PEOPLE TO TAKE
CARE OF THEIR TEETH AND THEREBY INCREASE
THE WEALTH OF THE NATION?

BY PROF. DR. JESSEN, Strassburg, Alsace.

Translated by F. E. Dodge, D.D.S., Strassburg.

IN the "International Archive for Public Mouth Hygiene," pamphlet 3, June, 1911, Dr. Phil. Otto Volz, member of the Commercial Statistical Advice, of the Imperial Statistical Bureau in Berlin, asks: "How must a people pay for the non-use of the tooth brush?"

He shows that in Germany, of the nearly 65 million inhabitants, only one-fifth (13 million) give regular attention to their teeth and go to a dentist. Of the remaining 52 million people, at most ten per cent. (5 million) possess a tooth brush. According to that, 47 million people in the German Empire do not know what it is to clean their teeth! This number practically agrees with authorities who estimate that at most 18 to 20 million tooth brushes are used yearly in Germany.

By very careful estimation, placing the figures low, Dr. Volz further reckons that German workmen and wives, together about 40 million people, spend in the neighborhood of 220 million marks yearly for food, from which their bodies in no way benefit, on account of the bad condition of their teeth allowing food of that value to pass through the system without being digested—at that, a loss of only $1\frac{1}{2}$ pfg. of food per day per person is reckoned.

To be added to that, is loss of days of work or premature loss of capacity to work, due to stomach and intestinal troubles, anemia and under-feeding, due to bad teeth. At the low estimate of a loss of $3\frac{1}{3}$ days a year, per workman, 30 million men lose 100 million days, which, at 2 marks 25 pfg. a day, makes a pecuniary loss of 225 million marks. By including sick fund expenditures, invalid and old age insurance, and other calculations too numerous to mention here, a total loss of 645 million marks yearly is reached.

The general establishment of rational care of the teeth, combined with timely and regularly recurring dental treatment, would in time reduce the decay of teeth one-half. By that means, 345 million marks would be saved, from which, however, would be deducted the expense of establishing dental treatment, including the salaries of 5,000 to 6,000 dentists, and the expense of their preparatory dental study, amounting to 135 million marks.

Of the 210 million marks saved, about 185 million would be saved to German workmen, 15 million to the authorities, and 10 million to employers. To save these 210 million marks, systematic dental care is necessary. What is the surest and quickest way to gain this end?

As Dr. Volz correctly says, by following out the plan of the German Central Committee for care of the teeth in the schools; examination of the children entering school, prompt attention in the school dental clinic, and instruction by the teachers in the schools is doubtless the best way. As a result, care of the teeth is introduced into the homes. Aside from that, in the free clinics, part of the grown people receive explanations and instructive written advice teaching the value of the teeth. The army recruits see the value the military place on the teeth. The press, in a praiseworthy and disinterested way, supports all these efforts. But still, it is found by experience, that through teaching alone little progress is made.

What way then shall be chosen to win over 47 million people to take care of their teeth and save the before-mentioned 210 million marks yearly to them?

Naturally, it cannot be accomplished all at once, it must be slowly, gradually—but it must be done. They must be won for a pronounced improvement in the health of the people means an increase in the capacity of the people and an increase in the wealth of the nation effected thereby. They can be won if the schools take a greater interest in the work, if they not only teach but carry out practical care of the teeth. The schools must take a step forward.

In Strassburg the public schools have taken this step. Here, twice a year, statistical reports are made of the dental treatment of children in the public schools. The scheme of these reports is so clearly shown on the appended blank form that a further explanation of them seems unnecessary.

If all the schools of the German Empire, city and country, follow this example, and dental treatment is introduced in them, in a few years rational care of the teeth will be general and thereby much will gradually be added to the wealth of the nation.

STATISTICS.

Report of Care of Teeth in the Public Schools of the City of Strassburg, Alsace.

Protestant Boys School _____
Catholic Girls _____

Room	1	2		3		4	5		6	7	already treated		Remarks*
	Total numbr of pupils	have		of the latter		clean their teeth	have tooth ache	by private dentists	in the city school dental clinic				
		tooth brushes	No tooth brushes	will buy tooth brushes	cannot buy tooth brushes								
I													
II													
III													
IV													
V													
VI													
VII													
VIII													
Total													

Oct. 1st,
Strassburg, Alsace _____ 191..
May 1st, _____

The Principal,

*The totals of the following columns must agree; $2 + 3 = 1$ and $4 + 5 = 3$.

In all classes an examination of tooth brushes is to be made twice a year, and the above form filled out.

All children having toothache must be instructed to go to the dental clinic on the school-free afternoons.

All children who can must be made to furnish their own tooth brushes.

SCHOOL INSPECTOR FOR THE DISTRICT: MOTZ.

For the Office of the Mayor, Loco, and of the District School Inspector.—*Dental Brief*.

FOURTH ANNUAL REPORT OF SCHOOL MEDICAL OFFICER*

Abstract by WM. RESHTON, L.D.S.

Through the kindness of Dr. Sim Wallace I have received the annual report of the School Medical Officer to the Education Committee of the Salop County Council, Dr. James Wheatley. The report is a monument of industry and enthusiasm in perhaps the most important and beneficent work which can fall to the lot of man, and in it Dr. Wheatley has laid the community under a debt of gratitude. The portions which chiefly concern us are those connected with adenoids and decay of teeth, and I shall endeavour to give our readers an abstract of the work done in those departments, eliminating most of the laboriously compiled statistics and stating the broad facts and comments upon them.

DEFECTS OF NOSE AND THROAT.

The defects of the nose and throat were almost entirely obstructive conditions due to adenoids and enlarged tonsils. There were 420 cases of adenoids and 573 cases of enlarged tonsils requiring treatment. In addition there were a large number of children who were suffering from these defects in a minor degree, and to whom instructions were given, particularly with regard to breathing exercises.

There is still considerable doubt as to the exact causes of adenoids and the relative importance of each.

The conditions favoring the production of adenoids appear to be:

1. Inadequately developed throat and nose, probably due to some extent at least to the absence of food requiring mastication during early childhood.

2. Almost constant exposure to infection in schools.

*Fourth Annual Report of the School Medical Officer to the Education Committee of the Salop County Council, 1911. By James Wheatley, M.D., D.P.H. Published by courtesy of *Dental Record*.

3. Absence of proper care in keeping the nasal passage clear and in correcting the faulty habits of breathing through the mouth.*

If these are the conditions and habits responsible for the production of adenoids the measures that should be taken are evident.

Whether the abolition of the present sloppy method of feeding children, and the substitution of more natural and physiological methods would have any great effect in preventing this condition is a matter on which there are differences of opinion. Its enormous benefits in other directions are, however, indisputable.

The almost constant danger of infection from the various organisms responsible for common colds can only be lessened by efforts to obtain better ventilation, more air space, better separation of the children, and more adequate cleansing of the school rooms. In all probability too, the raising of the age of school attendance to six years, at least in country districts, would bring about an improvement in this and allied conditions.

A most important matter is the strict supervision at home and at school, with the object of seeing that the nasal passages are kept clear, that the child does not breathe through the mouth, and particularly that the child does not sleep with its mouth open.

Finally as a matter of prevention breathing exercises should be carried out at school with regard to all children, frequently and efficiently.

With the object of getting proper attention for all cases in the earliest stages the following leaflet has been drawn up:

MOUTH BREATHING AND ADENOIDS.

Habitual breathing through the mouth is very injurious, causing frequent colds, deafness and mental dulness. It may be a habit or be due to obstruction in the nose or throat (adenoids).

When it is simply a habit, it can be cured by breathing exercises and by constant correction. The child should be provided with a handkerchief, and should use it when necessary, and always before going to bed. Particular attention should be given to see that the child sleeps with its mouth shut.

In serious cases of adenoids, an operation is necessary. After operation breathing exercises should be practised until easy nose breathing is established, and for at least six months.

Slight cases of adenoids may be cured without operation, if sufficient care is taken with the breathing exercises and the other precautions.

*I know of many cases in which none of these reasons apply; the true cause is yet to seek.—W. R.

BREATHING EXERCISES.

Before commencing the exercise, the nose must be blown thoroughly. During the exercise the mouth must be closed, and all breathing done through the nose.

The child should stand upright with the hands resting lightly on the lower part of the front of the chest, so that the movements of the chest can easily be felt.

The child should breathe in slowly and deeply and then breathe out quietly and slowly.

This should be done twelve times to the minute, and should be carried out for three minutes every night and morning.

The window of the room should be open and the clothing loose.

The following quotation from Sir George Newman's report for 1910 sets out the various measures to be adopted in dealing with adenoids in their proper perspective. The italics are Dr. Wheatley's.

“It is a matter of much moment that there should be a full appreciation of what is involved in the *treatment* of adenoids. This term has been confined too exclusively and with much disadvantage to the child, to the actual performance of a surgical operation on the throat. This procedure, though often necessary, is but a link in the chain of treatment, and is one which should become increasingly unnecessary. *Indeed, the gradual decline in the occasion for this operation will constitute in some measure a test of the efficiency of the work of medical inspection and the consequent treatment of disease in its early stages which should naturally follow.* At present there is still insufficient attention paid to such treatment of disease in its early stages or when chronic catarrhal conditions are the only effect. It is important that *all* cases presenting symptoms of adenoids should be treated, that is, followed up systematically and with precision both in the home and the school. Whenever possible the parent should be interviewed by the doctor himself, and the nurse should subsequently keep in touch with the home. A fair trial should be given to an improved hygiene, fresh air, diet, and tonics. Simple breathing exercises with the mouth closed, should be practised; they can be carried out in the home or the school. The necessary use of the pocket handkerchief should also be inculcated. The advantages of a convalescent home or a ‘country school’ should be borne in mind, and wherever feasible these children should, for a period of three months or longer, attend an ‘open air school,’ with its inestimable advantages of regular meals and suitable food, fresh air, the mid-day rest, the shower-bath and special attention to physical exercises, including breathing exercises.”

DECAY OF THE TEETH.

Dr. Wheatley remarks: "The classification of statistics has meant a considerable amount of work, but it will have been well spent if it helps to bring home to the mind of the public the appalling condition of the teeth of the present generation."

Special attention may with advantage be called to a few of the most striking points—

At the inspection age of 12 there were only four children in 100 with sound teeth; and at the inspection age of five, there were about seven children in 100 with sound teeth.

The average number of decayed teeth was 4.5 at 12 years, and 6.1 at 5.

The average number of decayed teeth at the age of five amongst the boys at the Whitechurch Town Schools was 9.2.

There were eight children with twenty decayed teeth at the age of five, *i.e.*, all the teeth were decayed.

At the age of five there were no less than 795 children out of 3,772 with ten to twenty decayed teeth.

Special inquiries have been made into (1) the influence of mouth breathing in the production of caries, (2) the relation between caries of the teeth and artificial feeding of infants, (3) eating of sweets as a cause of dental caries.

INFLUENCE OF MOUTH BREATHING IN THE PRODUCTION OF CARIES.

It may be taken as a fact that mouth breathing is a cause of irregularity of the teeth, and it is generally assumed that irregularity of the teeth prevents natural cleansing and consequently causes stagnation of food in contact with the teeth. If this is so, one would expect that mouth breathing would be associated with excessive amount of dental caries. An inquiry has been made with the object of throwing light upon this question.

The children are separated into two classes at each inspection age—one containing the children who were found to be suffering from adenoids sufficiently serious to call for medical treatment, the other containing the remaining children. The first class probably contains all the marked cases of mouth breathing.

	AGE 5			AGE 12		
	Number of Children	Number of Decayed Teeth	Decayed Teeth per Child	Number of Children	Number of Decayed Teeth	Decayed Teeth per Child
Children with Adenoids	191	1346	7.0	140	754	5.4
All other children ..	3581	21601	6.0	3196	14231	4.4
Percentage excess of decayed teeth amongst children with adenoids ..		16.7			22.7	

These figures show a considerable excess of carious teeth amongst children with adenoids. They also show that apart from the presence of adenoids and mouth breathing the causes of dental caries are still very potent. It is quite possible that if these causes were rendered less operative, the effect of adenoids and of mouth breathing in the production of dental caries would become much more obvious.

CARIES OF TEETH AND ARTIFICIAL FEEDING OF INFANTS.

It is frequently suggested in dental text-books, that the prevalence of caries is due to some extent to hand feeding of infants. It is evident that any inferior process of feeding, or any method of feeding that is liable to produce illness, during the formative period of the teeth, is likely also to cause some amount of mal-development of the teeth. The point, however, is whether, of the enormous mass of dental caries that exists, any considerable proportion can be attributed to artificial feeding of infants.

The present investigation was commenced in October, 1910, and has been carried on through 1911. The figures for the year 1910 were published in the report for that year.

At each age period and in both town and country schools there is a slight excess of caries amongst the artificially-fed children.

A study of these figures and a further study of the individual cases, appear to show that although natural feeding is better for the teeth (as it no doubt is for every structure of the body), artificial feeding is only a small and probably indirect factor in the causation of dental caries.

Numerous instances have been met with of artificially-fed children with excellent teeth, and in fact at the age of five the children free from caries bore the proportion of 1:14 in artificially-fed children and 1:16 in naturally-fed children.

The following inferences may probably be drawn :

(1) That artificial feeding, as carried out, favors, to some extent, caries of the teeth.

(2) That this factor is small compared with other factors.

(3) That it is quite possible to have all the teeth free from caries in artificially-fed children. (This freedom was actually greater amongst these children than it was amongst the naturally-fed children).

It is conceivable that artificial feeding during infancy might act deleteriously and favor the production of caries in the following ways:

(1) The artificial food may possibly not contain in sufficient quantity the elements necessary for proper tooth formation.

(2) Illnesses may be caused by improper artificial feeding, and these may interfere seriously with the growth of the teeth.

(3) Sloppy starchy foods may be given earlier and longer in artificially-fed children, with the bad effects previously explained.

(4) Malformation of the jaws may be produced mechanically from the absence of the forces brought into play in natural suckling, and by the use of artificial teats.*

EATING OF "SWEETS AS A CAUSE OF DENTAL CARIES.

The term "sweets" is used with the popular meaning, and does not include sugary foods taken at meal times. The classification adopted was:

Class 1. Large quantities of sweets eaten—almost every day.

Class 2. Considerable quantities eaten—several times a week.

Class 3. Few sweets eaten—about once a week.

Class 4. No sweets at all eaten.

The classification is necessarily somewhat vague and is not one that can be applied with exactness. Many individual errors will no doubt have occurred, but in the aggregate the classifications are probably sufficiently correct.

Enquiries were made with regard to 3,634 children in all, and included enquiries both from the children and from the parents when present.

The results are stated in tabular form. The number of children is given in each case, so that the value to be attached to the figures can be estimated.

*I have proved to my own satisfaction that teeth free from caries in well-developed jaws can be produced in bottle-fed children, provided that Dr. Sim Wallace's teaching is enforced. Dr. Wheatley's figures show very little difference between the two classes and he admits the factor is slight.—W. R.

Average Number of Carious Teeth per Child.

	Class	1	2	3	4
Age 5.		Large.	Considerable.	Few.	None.
Number of children.....		79	503	774	16
Average number of carious teeth per child		8.9	7.3	5.5	2.6
Age 12.					
Number of children.....		65	549	935	11
Average number of carious teeth per child		6.5	5.1	4.3	2.6

Number and Percentage of Children Free from Caries.

	Class	1	2	3	4
Age 5.					
Number.		1	30	65	3
Percentage.		1.3	5.8	8.4	18.8
Age 12.					
Number.		0	8	46	3
Percentage.		0	1.5	4.9	27.3

Number and Percentage of Children Free from Caries or With Less Than Three Decayed Teeth.

	Class	1	2	3	4
Age 5.					
Number.		4	71	212	11
Percentage.		5.1	14.1	27.3	68.8
Age 12.					
Number.		2	75	234	6
Percentage.		3.1	13.7	25.0	54.5

These figures are striking,* and if they could be taken without any reservations, they would go a considerable way to confirm the popular notion that the eating of sweets is one of the potent causes of dental caries. There are one or two qualifying observations that must be made.

The number of children classified in group 4 is very small, and this fact detracts seriously from the figures relating to this group. The same remark applies to a lesser extent to group 1.

Although, I believe, the medical inspectors, in classifying the children in groups, have attempted to arrive at an unbiassed opinion, it is possible that they may have been unconsciously influenced

*And confirm the opinion of Mr. J. F. Colyer, Drs. Stanley Colyer, Sim Wallace and others.—W. R.

to some extent in doubtful cases by the condition of the teeth. The medical inspectors are of opinion that they have not been so influenced. To completely remove any such doubt, the enquiries should always be made and the child classified before the teeth are examined.

It will be observed that amongst those who have eaten large quantities of sweets there are a certain number who are comparatively free from caries. If sweets are injurious, one must assume that these children are particularly favorably situated for resisting the ill effects. It is quite possible that sweets may be harmful to the teeth in the vast majority of the cases, and yet prove harmless if the teeth are well formed, and regular, and the dietetic habits in other respects good.*

CAUSATION OF DENTAL CARIES.

Although many points still require elucidation there is much sound foundation for preventive work. Broadly speaking, the primary causes of dental caries are those conditions which favor the acid fermentation of carbo-hydrate food in contact with the teeth. These conditions are (1) Malformation of teeth.—This is due principally to ill health of the child and the mother during the formative period of the teeth, *i.e.*, during the period before birth and the first years of life. Ill-formed teeth are not only liable to collect food in crevices, cracks and pits, but they do not permit of proper mastication and therefore proper natural cleaning. (2) Overcrowded and irregular teeth.—This conditions is due to lack of development of the jaws during the period of growth, partly at least from insufficient exercise. It is also undoubtedly caused by mouth breathing. The proper development of the tongue through exercise in mastication, and the constant outward pressure on the jaws and teeth that it exerts when the mouth is closed are probably very important factors in the broadening of the arch of the jaw. (3) Defective habits of mastication.—These defective habits are caused by slop feeding in early childhood. As mastication is the natural means of cleaning the teeth, defective mastication must result in adherence of food to the teeth, and consequent decay. (4) Soft, sticky character of diet.—A diet of this character, without firm cleansing food, must lead to deposit of food about the teeth.

*I have recorded several cases in which children were given chocolate sweets last thing at night habitually and yet had good teeth. The explanation given above (which is also that given by Dr. Sim Wallace) is probably the correct one.—W. R.

There may possibly be other predisposing conditions, such as soft structure of the tooth, alteration of mouth secretion, etc., but of these, there appears to be no positive knowledge.

PREVENTION.

The prevention of caries resolves itself practically into measures for the development of the jaws and muscles of mastication during early childhood, the formation of good habits of mastication, and the regulation of diet with the object of leaving the teeth clean after each meal.

The prevention of malformation of the teeth, apart from their arrangement, includes almost the whole domain of infant hygiene and cannot be considered in any scheme for the prevention of dental caries. In other words, nutrition of the infant, the prevention of rickets, the prevention of acute illnesses, must of course be considered, and attempts made to prevent them, on account of their effect on the body generally. There is one matter in this connection that requires careful attention, *viz.*, the necessity for very careful attention to the teeth and mouth cleanliness generally, during acute illnesses.

With the object of putting these ideas into a form that can be readily understood and carried into practice, simple rules have been drawn up and embodied in the following leaflet:—

PREVENTION OF DECAY OF TEETH.

Food often sticks about the teeth after eating. It then decomposes and acts upon the teeth, causing them to decay. It is the starchy and sugary foods (see below) that do the harm, when they stick to the teeth. If food can be prevented from sticking to the teeth there will be no decay. To prevent decay you should observe the following rules:—

(1) As soon as an infant needs other food than milk (8-9 months) give it in a solid hard form requiring mastication, such as crusty bread, twice baked bread, or crisp toast. In this way good teeth are likely to grow and good habits of mastication will be formed. Never give bread soaked in milk, or flour added to milk, or other soft starchy foods (such as most patent foods).

(2) As the child grows up you should still give most of the food in a hard form, compelling mastication. Food should rarely be taken in a liquid form, or soaked in liquid or minced. Bread should not be eaten new, and it should have plenty of good firm crust.

(3) Drinking between each mouthful* is very injurious. Liquids

* "And during each mouthful" might also be added.—W. R.

should be taken principally at the end of a meal.

(4) Sweets should never be taken between meals, nor the last food in a meal; but only along with food requiring mastication.

(5) A meal should always be finished with a cleansing food (see below). It is very desirable that fresh fruit should be eaten freely, particularly at the end of a meal. This is most important with regard to the last meal of the day.

(6) Mouth breathing in children should always be corrected, and, if obstinate, medical advice should be obtained.

EXAMPLES OF FOODS.

Starchy Foods.

Bread, biscuits, etc.; potatoes, rice, tapioca, sago, etc.; oatmeal porridge and similar foods; patent foods.

Sugary Foods.

All foods to which sugar is added; sweets of all kinds; honey, milk, jams, marmalades, patent foods.

Cleansing Foods.

Fresh fruits—particularly apple—nuts; raw vegetables—celery, radishes, lettuce, onions, carrots, etc.; crusts of bread, crisp toast, twice-baked bread, meat, fish, bacon.

An attempt is being made to educate the inhabitants of the country with regard to the cause and prevention of dental caries. Lectures are being given to school teachers, and they in their turn give simple talks to the children, using this leaflet as a basis. The leaflet is also distributed through the children to each household. Something is being done through the midwives and nurses, but no systematic effort has yet been made in this direction.

Dr. Wheatley feels very strongly that this work of prevention of dental caries cannot be properly carried out without a staff of efficiently trained health visitors, whose work would not be confined to infants under one year of age, but who would keep the children under supervision until they arrived at school age. Such a staff would necessarily fulfil many other important duties, but he has no hesitation in saying that if they could make a very appreciable reduction in the amount of caries, say a 50 per cent. reduction, this alone would pay for their services over and over again, in greater efficiency and better health of the inhabitants of the country. It must be remembered that the educational work necessary in this direction would be a decreasing quantity, for the principles taught would become part of the habit and tradition of the people. It is

†The coarse whole meal flours are better for this purpose.

an undoubted fact upon which practically all observers agree, that amongst the children of our elementary schools the most neglected have the least caries. This must mean that the extra care given by conscientious parents to their children has resulted in a harmful effect upon their teeth. The evil arises then not through neglect or carelessness, but through ignorance. It is most imperative, therefore, that education authorities and sanitary authorities should do all in their power to remove this ignorance.

On this point Dr. Towers says:—"With regard to dental caries, one cannot fail to notice that in many cases of only too apparent neglect at home, the child presents for examination a set of teeth almost, if not quite, perfect. Not only are the teeth in good condition, but they are also clean. On enquiring into the diet of these children, it is found that the crust, despised by many children in more happy surroundings, is the chief item on the restricted menu of the former. We may conclude, I think, in the absence of any pretensions to the use of a tooth-brush, that the crust is the cleansing agent, and it would be well if all were to include it in their diet."

As a matter of personal cleanliness and as an additional preventive measure, the use of the tooth-brush should always be encouraged.

Sir George Newman, in his annual report for 1910, says:—"Indeed, it is probably true to say that there is no single ailment of school children which is responsible directly or indirectly for a larger proportion of the delicacy and disease (including constitutional disease) which is found at every turn to handicap efficiency, both physical and mental."

Dr. Wheatley concludes by saying: "Personally I am more than ever impressed with the fact that in the prevention of dental caries and oral sepsis is the greatest field for personal preventive medicine at the present time."

The above gives a fair *résumé* of Dr. Wheatley's report, which is not only a record of work done for the benefit of our children, but is also of great scientific value, and, last, but not least, an example for other workers.

PRACTICAL PROSTHETIC CASTINGS.

BY F. EWING ROACH, D.D.S., CHICAGO, ILL.

(Continued from page 406)

In time to come casting will be understood and practised along scientific lines. Until that time comes a vast majority of dentists will have been duped and the great mass of the public will have been imposed upon, but he, the vulture and the rapacious neighbor, will have enriched himself at their expense and at Dr. Taggart's expense.

I have had the use of nearly every machine brought out for dental castings, and the process itself has conjured up a great many problems for me, and the result of the experiment in that line may be summed up as follows:

(1) It is impossible to do proper crown and bridge work unless you use the casting process.

(2) Far from reducing the need of digital dexterity, it calls forth every artistic tendency which may lie dormant in the student.

(3) It makes possible, as nothing else can, the anatomically correct restorations of lost dental organs.

(4) It will in time bring to the dentist a desire for and a knowledge of things that are beautiful in his work.

(5) It will be the cause of bringing to us a great many new and better alloys of the royal metals and, incidentally, will increase our knowledge of metallurgy.

And here are a few simple rules which, if you have a Taggart machine, will aid you to obtain nearly perfect results:

(1) Put your sprue wire into the thickest part of the wax inlay.

(2) Be sure your investment has been mixed according to directions and measurements, and be sure that you have carefully covered your wax model before filling the flask.

(3) Be sure your investment is hard before you remove your sprue former.

(4) Be sure that the heat you apply to destroy your wax model is a very gradually increasing one, and be sure you have destroyed every vestige of it before you remove the flask from the flame.

(5) Allow the flask to become stone cold before you place it upon the seat of the machine.

(6) Be sure the holes in your plunger head are not stopped up, and open your nitrous-oxide valve to its full extent.

(7) Use only clean metals for casting. Bring them to a melting point as quickly as possible, continue the heat until the mass boils, then bring the plunger down as rapidly as you can, for upon this depends the instantaneous casting. And only these castings are nearly perfect.

(8) In casting large saddles, insert the sprue wire not at right angles to the piece but at an oblique angle, and the greater the oblique angle, the more chance of obtaining a perfect casting.

Remember that casting at right angles you are forcing the metal into 360 radii of a circle, and that the result will be successful in proportion to the direction, torsion and undulation of the radii.

(9) Cast individual inlays in pure gold containing 5 per cent. platinum. You will get sharper castings and they will not flow under stress of mastication.

(10) Inlays to be used as abutments should contain at least 10 per cent., better 15 per cent., of platinum, which in turn should contain 10 per cent. of iridium.

(11) If you are doing extensive saddle casting, your alloy should contain 19 per cent. iridio-platinum, 6 per cent. of silver, and 5 per cent. of copper. This will give you a spring alloy you may cast several times without losing its virtue.

(12) In preparing a cavity for an abutment inlay, be sure that your occluso-cavico surface is at acute angles with your disto or mesio cavico surface. This simple precaution will take the place of supplemental pin anchorage and will not weaken the tooth.

I do not agree with the essayist's method of root preparation. The method he advocates does not, to my mind, best conserve the root. I prepare mine with a bevel of varying degree, so that the cast piece grasps and holds the root around its external circumference, and this effectually prevents splitting and rotation.

I want to commend the essayist's ingenious technique for restoring to usefulness roots that have split. It seems to be the best method ever devised for this sort of work.

Again I wish to extend my sincere thanks to Dr. Roach for his very comprehensive paper.

Dr. J. E. Nyman, of Chicago.—A good deal of the discussion to-night reminded me of a discussion I once heard in the House of Lords in England. I was privileged to hear there a very scholarly and very learned gentleman, who spoke somewhat as follows: "I wish to make a most deliberate and emphatic statement. However, I reserve to myself the privilege of refusing to interpret this statement and also refusing to accept the responsibility of any other

gentleman's interpretation of this statement, either at this time or any other time."

I cannot do more than pay a tribute to what I know of the genius and operative skill of the essayist of this evening. I might reassure one or two of the gentlemen who were a little skeptical as to the splints. I am fortunate in having as associates Dr. Orr and Dr. Bryan, who made these devices. I have seen Dr. Orr construct three splints similar to that, and set them successfully in the mouth. It requires almost infinite patience and infinite skill.

Dr. Nelson T. Shields.—I thank you very much for the privilege of discussing Dr. Roach's paper.

The paper bears a very close relation to the last paper Dr. S. G. Perry wrote and read before this Society this winter. Dr. Perry always had the good of the profession at heart, and that fact alone will give Dr. Roach's paper strong endorsement. I regret the paper does not describe a crown whereby an entire upper or lower denture could be restored. In this strenuous age any crown should embody not only strength within itself, but should be so constructed that many crowns could be soldered together and contoured perfectly for the restoration of the many cases you meet in private practice.

The inferior splint, as shown on the screen, is evidently constructed on teeth with pulps alive and the teeth quite extensively mutilated. This manner of splinting I am absolutely opposed to, for the definite reason that the comfort of the patient will be very temporary on account of the calcification of odontoblasts at the points nearest the irritation throughout the dental pulps. To extirpate these pulps in the beginning and fill the roots on scientific lines, and construct a splint without mutilating the contour of the labial surfaces, positively anchoring the splint in the pulp canals, and so contoured at the cervical margin that the hygiene of the mouth can be easily maintained, are the lines on which such a splint would be constructed in my hands. In reference to setting the pivot in the posterior root of the lower bridge, as shown upon the screen, the bridge would be infinitely better constructed to have the pivot inclined forward, being anchored in the anterior root and soldered to the posterior grinding surface at the time the crown was made, and straightening the anterior wall of the natural tooth. All bridge work abutments should be anchored positively. The extirpation of pulps and anchoring gold inlays with pivots into the roots is a practice which has been successfully carried on by me for twenty years, and was made known by me before this Society at least fifteen years ago. Furthermore, I have stated before this Society, and to the best of my knowledge, I am the first to have stated, that no abutment

should be constructed for a bridge or permanent splint without having first extirpated the dental pulp, and fortunately many have realized the truth of my clinical experience. If Dr. Van Woert would construct his inlays for abutments in this manner he would have no trouble; my long experience has taught me that this class of workmanship is absolutely beyond any experimental stage.

In reference to Dr. Ash's remark on needless strength for splints, I would like to state that a great deal more strength is necessary for the retention of loose teeth than teeth that are not loose. The greatest possible strength should be employed in selecting suitable metals such as platinum and iridium, and half round clasp metal between stays, which, when soldered, will give the greatest strength within the smallest space.

I very much enjoyed Dr. Roach's paper, but there is nothing new in it. The repetition of facts, however, is desirable.

CLOSING DISCUSSION.

Dr. Roach.—I am surprised Dr. Van Woert did not disagree with me at all. He appeared all the time to be disagreeing with me, and yet at the same time I believe he corroborated my position absolutely. I am very emphatic in regard to the use of junk gold. Better not use it at all, unless for the cusps of the gold crown.

The claim has been made that these all-gold crowns are too expensive, on account of the greater amount of material used in their construction, but as Dr. Chayes and others have said, we should not let this influence us in our choice of the procedure best suited to the case.

With regard to the repair of the cast base crown, how will Van Woert repair his crowns? I claim this is just as easily repaired as Dr. Van Woert's crown or any other crown. I admit the crowns are not exact duplicates in each case, but I can grind them and I can prove that they are sufficiently accurate. I never have had to repair one, as a matter of fact. I believe they are the strongest crowns I have ever made, and I believe they are the strongest that can be made. I believe the repair can be made more easily and with more accuracy than any other crown I have any knowledge of, so I think the repair feature of it is certainly in favor of the cast base form of construction.

I made the statement that I do not advocate the use of bands as a rule. I prefer the crown without a band in most individual crown work, but for bridge abutments the band is usually employed.

I called particular attention to the lack of tensile strength and elasticity in castings, and emphasized the necessity for iridio-platinum reinforcements.

I also tried to make clear that inlays as abutments for bridges should be used very cautiously. I believe that inlays may be used advantageously for bridge abutments where sufficient supplemental pin anchorage is employed.

I agree absolutely with Dr. Van Woert in regard to clasps. I think the cast clasp has no place in practice at all. The material has no tensile strength, and is brittle, and has no spring in it. I made some and they invariably broke, so that I do not recommend casting for clasps.

Dr. Ash stated that I spoke of using junk gold. I omitted the part that it might be permissible to use it in the casting of the occlusal surface of the gold crown, and that would be the only place.

Dr. Ash.—And that would be only in case you had nothing else in the office?

Dr. Roach.—Yes. While Dr. Chayes disagreed with the substance of my paper in many respects, I do not see wherein there is any great amount of difference between his idea of constructing the crown, and mine, because he speaks of the elimination of the band, or, rather, he does not favor it, and he proceeds with a particular method that he has found satisfactory to him.

Gentlemen, I hope I do not appear to be dogmatic. It was not my intention to be so. I merely give you these ideas as a way these different pieces of work may be done. You can adapt the principle to your various uses. The personal equation enters into every operation, of course. It is the principle.

I would like to bring to your notice what in my opinion has been a deficiency with reference to the use of casting in prosthetic work.

As Dr. Van Woert stated, this is merely in its infancy, but I feel I have gotten a little beyond the infant stage with this process, and I know I am getting results that I never could get with the old swaging process. I believe it is a question of acquiring the technique and understanding the difference in the physical properties of cast metals, and that of drawn and rolled metals, and adapting the two metals individually, and in combination, to meet the requirements. That, it seems to me, is all there is to it.

There is no question of the greater adaptability of wax over gold, and the cast metal has not only shortened my work and my methods, but has given me better results in almost every instance.

Mr. President, I thank you for your patience in listening to what has been rather a tedious evening in trying to cover too much ground, and possibly not confining myself to fewer methods instead of trying to give so much.

A hearty vote of thanks was tendered to Dr. Roach for his excellent paper.—*Journal of the Allied Societies.*

THE VALUE OF TEETH TO CHILDREN FROM THREE TO SIX YEARS OLD.

BY ALONZO MILTON NOBINE, D.D.S., NEW YORK.

SOUND, regular, clean, deciduous teeth are wealth of wonderful worth to children. Such teeth are of a fourfold value. First, as organs of mastication; second, as spreaders and moulders of the permanent arches and nasal passages; third, as guides for the eruption of permanent teeth; and, fourth, as organs assisting in clear speech.

A sharp line of demarcation indicating where each function ends and the other begins cannot be drawn. Each merges gradually into the other. It cannot be said of any tooth or of any group of teeth that it serves but one particular purpose.

Teeth, as organs of mastication, are more valuable to children of from three to six years of age than to adults, because "Adults are not only better able to chew with an imperfect masticating apparatus, but their digestive organs are better able to cope with imperfectly chewed food than are the digestive organs of children."

Deciduous teeth are as well designed to perform their functions as permanent teeth are to perform theirs. No teeth, deciduous or permanent, were ever formed for the purpose of chewing pap or mush, but they were formed to chew hard, resisting food. Teeth that are so exercised never fail of their function or fail to improve by the exercise of their function.

It is obviously necessary that food for children have the required nutritious elements. It is equally essential that this food be chewed thoroughly so that the contained nutriment be released, digested, absorbed and assimilated.

Children suffer from malnutrition when supplied with wholesome food which is not chewed, just as surely as those who are not supplied with sufficient food. Chewing of hard, resisting food not only prevents decay of the teeth, but strengthens the gums, making them almost germ-proof.

An extensively decayed deciduous molar puts five teeth out of commission; half the chewing apparatus is rendered infective, *i.e.*, the decayed tooth, the tooth on either side, and the two teeth above. When decayed teeth are present, the habit of bolting food is begun. A child will not chew on aching, sensitive teeth. The child's stom-

ach, being unable to digest half-chewed food, is soon irritated and the first step of malnutrition is taken. All authorities testify to the marked lack of resistance to disease in the poorly nourished child.

Feeble powers of digestion and assimilation prevent the cure of the malnutrition of which all three are parts. Surely this is a hopelessly vicious circle. "The diseases in which malnutrition plays its most conspicuous part are measles, inanition, convulsions, phthisis, bronchitis, pneumonia, croup, debility, atrophy, and diarrheal diseases."

Decayed teeth in children are not only depots for breeding germs, but also factories for manufacture of pus, toxins, ptomaines and other poisons that seriously affect the stomach and the gastrointestinal tract, blood, lymph, and nervous system.

Rheumatic fever, the disease of childhood next in importance to tuberculosis, frequently receives its initial infection from decayed teeth. Rheumatoid arthritis or arthritis deformans also is more frequently observed in children with decayed teeth than in children with sound ones.

Natives of countries where hard food is eaten have strong, broad jaws and sound teeth. The explanation of this is based on the following observations: The lower jaw is a bow with no brace to prevent the ends from separating; when hard food is chewed the force is exerted so as to open or spread the bow; as the lower jaw is widened the upper arch also spreads; when the upper arch is spread the dome (hard palate) is lowered and the nasal cavities enlarged.

Another force is also at work when a complete set of deciduous teeth is in position. With the mouth closed, the tongue is brought in contact with the teeth, so that during the swallowing the air is sucked out of the mouth cavity, while the atmospheric pressure in the nose cavity forces down the nasal floor of the hard palate.

When teeth are decayed or ill arranged these forces are prevented; the results are contracted arches, crowded teeth, high dome, deflected septum, faulty breathing, inefficient mastication and malnutrition.

Evidence given by a series of radiographs, moulds and measurements establishes the law that the position of the temporary teeth and their spacing govern directly the eruption of the permanent teeth. The permanent teeth erupt in the same relative position, normal or abnormal, as the case may be, that the deciduous teeth assume. When deciduous teeth decay or are extracted and the remaining deciduous teeth move out of their correct positions, permanent teeth erupt in the same false positions.

For the correct pronunciation of certain sounds deciduous teeth

must be in their true position, neither decayed nor missing. Incisors are necessary for the pronunciation of the S sounds; the tip of the tongue comes in contact with the lower jaw and the air current passes through the space between the incisors. When these teeth are lost or decayed the tongue is projected into the vacant space and words or sounds are lisped.

When the molar teeth are lost or pushed out of alignment and the arches are contracted, a hissing sound is often produced, because air is forced through the vacant spaces. This lisping and hissing may be continued as a habit after the eruption of the permanent teeth. Lisping and hissing in most children after the eruption of the permanent teeth are due to contracted dental arches, malposed or missing teeth, or a previously contracted habit. In the Breslau public schools it was found that among the children having speech defects, 30 per cent. of the defects was due to decayed teeth, another 30 per cent. was due to dental deformities. These speech defects were cured by filling decayed teeth, orthodontic treatment and speech exercises.

A dentist is in the best position to observe these conditions and to grasp their significance. It is literally within his power to mould the speech, the physiognomy, the mentality, the disposition and the health of a child if he recognizes the great value of teeth to children between three and six years old—whether sound or made sound, whether occluding properly or made to occlude properly. Correctly placed, sound, deciduous teeth assure good health, clear speech, correct breathing, and properly erupting permanent teeth.

“In its effects nutrition is one of the most formidable factors in the shaping of individual and racial destinies.”

When those organs, whose office it is to prepare food so that it may successfully be attacked by the digestive ferments, are clean, sound and correctly placed, they become forceful motors in maintaining sound breath, proper development, and efficient mental and physical vigor.—*Dental Digest*.

SOCIETY PROCEEDINGS.

NEW BRUNSWICK DENTAL SOCIETY.

REPORTED BY F. W. BARBOUR, D.D.S., FREDERICTON.

THE meeting of New Brunswick dentists in annual session this year was more representative than has been for a number of years. Practitioners of sections of the province who had shown a slackening interest for a considerable period attended these meetings and gave a great deal of assistance in the work.

The meeting was held in Fredericton, the capital of the province, July 17th and 18th. The weather was delightful and the local dentists were able to display how well favored they were in having located in the beautiful "Celestial City." Ample room was provided for clinics, meetings and exhibits.

The example of Moncton in 1910 was followed and would be worth repeating wherever it was feasible. The exhibits and clinics were held in one large room, and by previous arrangement with exhibitors this room was closed entirely to the attendant dentists during the regular hours of presentation of papers and transaction of business. In this way sessions started remarkably on time, and little disturbance caused by wanderings in and out. Every matter that came before the meetings (and the programme was almost entirely fulfilled) received adequate attention, and the discussions, mostly prepared in advance, were distinctly well presented and received.

Official welcome was extended by Mayor Hooper, and the wide-open invitation to embrace every opportunity for a good time was undoubtedly taken thorough advantage of by all visitors.

Clinics of a practical character were presented, and these showed a keen appreciation of the need of keeping well to the front in the march toward higher conception and achievement in dentistry.

The following titles would indicate the class of clinics presented: "Restoration for Excessive Absorption, Using Jenkins' Porcelain," "Restoration of Lost Incisor, Using Pins and Inlays,"

"Dentine Anesthesia via Mucous Membrane," "Combination Gold and Silicate Inlays," "Removable Bridgework," "Goslee Crown Adaptation," "Duplicate Tin and Gold Fillings."

The papers presented were very comprehensive in their variety. "Kindergarten Dentistry," "Value of Community Organization," "The Pulp," "Anesthetics," "Business Possibilities for the Dentist," were ably written and called forth discussions that were admirable. The feature of outstanding interest was the combined address and demonstration by Dr. F. S. Belyea, of Brookline, Mass., a former New Brunswick man, and one of its most loyal friends.

Dr. Belyea gave practical presentation of the fascinating subject of "Facial Restoration Through Artificial Teeth." The contention was made and reasonably proved that age was evidenced in the face by the change of location of fleshy "padding," which by proper elevation and replacement would very largely restore the original expression.

The outstanding requisites were in the use of unusually large plumpers over the molars and what seemed revolutionary, pronounced enlargement over the centrals and none at all over the cuspids.

A variety of other points were emphasized and the whole very impressively demonstrated by the presentation of a patient of about 70 years of age for whom Dr. Belyea had inserted two upper and lower, and which gave results that, in the opinion of all present, justified all that the clinician had claimed.

Relaxation from distinctly business and instructive features was afforded the final afternoon and evening of the gathering.

A spectacular baseball game was enjoyed, especially by the grand stand, between married and single men. Some plays were introduced that were not previously dreamed of on any field. There is no danger, however, of any member of either team being kidnapped from the profession by any big league scout. The real thing in baseball, however, was offered a little later in a high-class game between Fredericton, pennant winner of N. B. and Maine League, versus St. John, the same hours being used by others than "fans" to see the horse races or take the sight-seeing drive provided. Finally came a farewell banquet, heartily enjoyed, which led to toasts and speeches on convention and its value were freely given.

The Fredericton dentists were highly gratified and felt unduly rewarded by the compliments extended and the thanks given, both in private and in public.

MULTUM IN PARVO.



This Department is Edited by C. A. KENNEDY, D.D.S.

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

Address. C. A. KENNEDY, D.D.S., 2 College Street, Toronto.

DON'T inject an anæsthetic until the mouth has been *thoroughly* washed out with an antiseptic, and carefully remove *all* deposits around the tooth to be extracted. Remember that the wounded surface will be in the best condition for absorbing infection.

COCAINE HABIT ACQUIRED AFTER DENTAL TREATMENT.—Dr. James A. Colton, Dental Inspector of the Public Schools in Providence, R.I., points out that the use of anesthetics for the relief of pain may lead to serious results, reporting as follows: "I desire to call attention to three cases which have come under my observation quite recently. Three boys of grammar school age have become pronounced cocaine victims from the employment of this drug, which was first used, according to their story, to relieve the suffering resulting from dental disease.—*British Journal of Dental Science.*

BAND ROOT ABUTMENTS.—In regard to bands for roots, of course such a thing is absolutely essential if you use root abutments for bridges. I regard it as essential in the construction of crowns, for we have observed a number of bad accidents in our own experience from our own cases, and in cases of others of fractures of the lateral roots, which have been crowned without using a band. It has come to be our practice to band all lateral roots and band thin bicuspid.—*J. E. Nyman, D.D.S., Chicago.*

VULCANITE DENTURES.—In the event of the base rubber showing through the pink at any spot after the case is vulcanized, the defect can easily be remedied by drilling out the base rubber with a rose-head bur and making the interior of the cavity larger than the opening. When this has been done, a small piece of the vulcanized pink rubber is cut from the distal end of the denture, warmed over a spirit lamp, pressed into the undercut cavity, filed up and polished. If the work is done neatly no joint will be visible.—*Ash's Monthly.*

PROTECTING METAL PLATES DURING VULCANIZING.—When a base plate of aluminum or Watts metal, cast or swaged, is used in plate work, it may become tarnished by the sulphur escaping in vulcanizing, making it difficult to regain the luster. This may be avoided by painting the exposed metal surfaces with shellac or sandarac, which will protect the metal from the sulphur and greatly facilitate the polishing of the metal.—*M. L. Schmitz, Dental Gazette.*

USING LEAD FOR PERFORATIONS OF ROOTS.—To repair a puncture of a root use a piece of lead or hammered shot, rather thick and pliable, and burnish over the opening. Hold firmly in place while cement is placed upon it and within the cavity and allowed to harden. Or for a canal, use a lead point and drive to place to make a tight joint.—*J. H. Spaulding, Paris, France, Dental Review.*

PACKING GUM BACK.—In order to keep the gum tissue from falling over the end of the root after preparation, procure a small tack with a flat head, imbed it in warmed gutta percha, shaped to a point; insert in root canal and press excess of gutta percha around end of the root and forcibly against the gum tissue. Hold in position till it becomes cool. At next treatment the end of the root will be clear for action.—*C. A. K.*

COTTON.—When loading your cotton holder, cut the end of the cotton as it comes from the roll crosswise into strips $\frac{1}{2}$ to $\frac{3}{4}$ inch wide. Pack these into the holder, and when using small bits of cotton you will be pleased to see how nicely you can get just what you want, no more.—*C. E. Allen, Pacific Gazette.*

REPAIRING BROKEN CABLES.—If a cable engine is used in the surgery or laboratory, the cable—which is sure to break sooner or later—should not be thrown away. It can be repaired by placing a duplex spring over the broken ends and attaching with soft solder. This repair requires but a few minutes, and the cable will render as good service as before.—*W. V. Wilkinson, Commonwealth Dental Review.*

METHOD OF FILLING A CAVITY AT THE BIFURCATION OF THE ROOT.—In cases where the gum has been denuded so far on the side of a tooth as to expose the roots below the bifurcation, thus allowing particles of food to work in and set up an inflammation that will eventually loosen and destroy the tooth, the following remedy gives happy results: If there is already a cavity cut through the bifurcation, a thin piece of lead is burnished into it with a stirrup extending out and resting on the gum; in fact, pressing into the gum with considerable force. The cavity can then be filled with amalgam, and an almost useless or loose tooth restored and made serviceable.—*G. S. Staples, Dental Brief.*

ARRANGEMENT FOR STERILIZATION OF THE OPERATOR'S HANDS.—The first step in any dental operation should be the preparation of the operator's hands. It is not allowable for him to go from one patient to another without thoroughly washing his hands, and it is not sufficient simply to wash with water. Soap should be generously used. A faucet of flowing warm water should be arranged, which is operated by stepping on a little button protruding through the floor. Three objects are gained by this: The hands are washed and rinsed by flowing water, which is preferable to a bowl of water; they do not touch a faucet handle, and they are warmed. A dentist should not touch a patient's face with cold hands. The tincture of green soap serves not only as a soap, but is one of the best sterilizing agents for the hands.—*L. E. Custer, Dental Summary.*

COMPOUND FRACTURES.—A distressing group of cases is furnished by compound fractures in which virulent infections occur. One has here a two-fold problem—the treatment of the infection and the treatment of the fracture. It is usually the best plan to clean up the infection before making any attempt at treating the fracture. The location of the fracture, the type of infection, and the form of immobilization, will largely govern the treatment in the individual case. It may be stated in general that the mouth should be made and kept as clean as possible. Hot, moist dressings will do much to control both the pain and infection. The seat of fracture should be freely irrigated with a warm normal salt solution and continued until all trace of infection has disappeared.—*F. B. Moorehead, Dental Review.*

No teeth, no stomach; no stomach, no brain; no brain, no man.—*F. J. Lutz, St. Louis.*

A SMOOTH GUTTA PERCHA FILLING.—In making a permanent filling a quantity of warm gutta percha sufficient to fill the cavity is dipped into validol (validol camphoratum is a colorless, oily fluid, whose chief ingredients are valerian, menthol and camphor) and firmly pressed into the cavity with a broad instrument. With a warm burnisher, previously dipped into validol, the surface of the filling is made smooth. If the amount of gutta percha introduced is not sufficient more may easily be added in the same manner. The excess can be cleanly cut off with a hot spatula. In trimming a filling the instrument should be heated, then dipped into validol and after use be thoroughly cleaned before being heated again. Fillings made in this way are always smooth, as the gutta percha, no matter how often it has been folded during introduction or smoothing, always unites again, thus making a perfectly homogeneous mass. This obviates the inconvenience to the patient often caused by the roughness of ordinary gutta percha fillings.—*H. W. C. Bodecker, D.D.S., M.D., Berlin, Germany (Review).*

ORAL HEALTH.

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EDITORIAL.

CHILD WELFARE EXHIBIT.

THE first Child Welfare Exhibit to be organized in Canada was held in the city of Montreal for a period of two weeks beginning 8th October, 1912.

Exhibitions of this character have been arranged in many European and American cities, and are, as the name implies, educational exhibits arranged for the furtherance of the health, happiness and development of the child.

The joint presidents of the Exhibit, Drs. J. G. Adami and T. Gauthier, in a statement issued over their signatures, have very clearly stated the objects of the Montreal Exhibit. We quote briefly:

"Surely it is our hope that this Canada of ours shall lead the world, that this land of promise shall become the land of fulfillment, that this youngest of nations, unfettered by the bonds of evil tradition which bind the old peoples, and profiting from their experience, shall choose out what is best, and press towards a greatness which other and older communities cannot hope to attain.

"But it is the man that makes the nation.

"It is the child that makes the man.

"If, therefore, we are to become a great nation the well-being of our children must be our first care: we must rear them so that healthy and sound in body and in mind, they develop into strong and capable men and women. This is a matter that cannot be left to nature and to chance. Already, with the rapid growth of our cities, the child is exposed to influences every whit as harmful as those affecting the old world.

"The object of the Child Welfare Exhibit is to demonstrate these dangers, and how they are to be guarded against; what agencies exist in our midst for the protection and betterment of child life; what is lacking, and what has to be provided in the immediate future. The dangers are not insurmountable; they must be surmounted. Our object is to train public opinion, so that all, from the lowest to the highest, may co-operate in making Montreal and all other Canadian cities the homes of a sound and progressive people within the opportunities which Canada affords."

It is gratifying to the dental profession to know that members of the profession in Montreal have been spending much time in planning for an exhibit that will bring to the public attention the relationship of good teeth to good health in the child. In the department of "The Health of the Child" in connection with the Exhibit the Province of Quebec Dental Association has been given credit by the committee for realizing the importance of the proper care of the teeth and a willingness to bring the subject prominently before those attending the Exhibition.

Upon the general subject of Medical Inspection of Schools the committee has issued the following statement:

"Medical inspection of our schools has done much to render the life of the school child more happy, and to prepare him or her for a more useful life. The most important infections to which the child, during its age of school attendance is subjected, are those due to conditions in the throat and nose, chiefly enlarged tonsils and adenoids, which cause stupidity and deafness and predispose to colds and to tuberculosis. Bad teeth also ruin many a digestion and lead eventually to many diseases, such as chronic rheumatism, which may be due to the absorption of poison from the decaying foodstuffs which accumulate in cavities. Improper methods of reading and sitting while writing, and the lack of necessary glasses ruin many a child's eyes. As the result of bad eyes not only is the individual's usefulness lessened, but headaches and other general symptoms of nervousness frequently develop.

"The community must, therefore, see to it that the inspection of school children must not be allowed to deteriorate for lack of funds. Parents must, moreover, realize the importance of proper attention to the advice of physicians and dentists, in respect to these matters, and should in all cases procure medical advice when their children do not appear to be normal mentally or do not hear or see properly, or are subject to headache, constipation or other digestive troubles."

MEETING OF THE EXECUTIVE OF THE ONTARIO EDUCATIONAL COMMITTEE.

THE Executive of the Ontario Educational Committee are arranging to hold a meeting of the whole committee at Toronto during the annual Flower Show, which takes place in November, and to which the railways sell single fare tickets.

This arrangement is in accordance with a resolution passed at the last meeting of the Ontario Dental Society at Burlington, which set aside a sum not exceeding fifty dollars towards defraying the travelling expenses of members of the committee non-resident in Toronto, who would attend a general meeting of the committee in Toronto. Although only the chairmen of the various local educational committees are thus entitled to have their railway fares paid for them, yet the executive hopes that many other men who are interested in dental educational work will feel enthusiastic enough to pay their own fares and attend the meeting in Toronto along with the regular members.

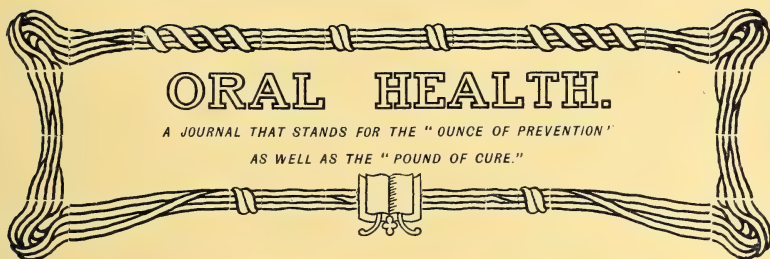
Many important subjects will be discussed, such as "Methods of organizing educational committees," "Methods of securing dental inspection in schools," "The establishment of public dental clinics," and "The giving of popular dental lectures," and other kindred subjects, which should make it worth anyone's while to attend even at the sacrifice of a little time and expense. Further information may be obtained from the secretary, Dr. R. J. Reade, 2 Bloor St. W., Toronto.

W. CECIL TROTTER, Chairman.

“ Whatever you are, be that ;
Whatever you do, be true. . . .
Straightforwardly act,
Be honest, in fact
Be nobody else but you.”



A. M. CLARK, L.D.S., D.D.S., WOODSTOCK, ONTARIO.



Vol. 2 TORONTO, DECEMBER, 1912. No. 12.

FIRST ANNUAL REPORT, 1911,
BOARD OF EDUCATION, TORONTO,
DEPARTMENT OF MEDICAL INSPECTION.

W. E. STRUTHERS, B.A., M.D., CHIEF MEDICAL INSPECTOR.

TO the Chairman and Members of the Board of Education:

Gentlemen,—I have the honor to submit herewith my first annual report of the Department of Medical Inspection and statistics showing work done for 1911.

With your permission I shall first enter into some general matters; second, outline the system of medical inspection as carried out in our schools; and third, give the statistics of the work performed by Medical and Dental Inspectors and School Nurses. . . .

.....

The British Board of Education says that medical inspection of schools is founded on a recognition of the close connection which exists between the physical and mental condition of the children and the whole process of education; that it seeks to secure ultimately for every child, normal, or physically defective, conditions of life and body compatible with that full and effective development of its organic functions, its special senses, and its mental powers, which constitute a true education. Educational authorities, while making diligent efforts to provide the best facilities for the education of the child, its protection from fire or other dangers, have not always realized the importance of preserving and conserving

its physical well-being. It is now a well-accepted fundamental principle that the State is justified in assuming the function of education and in making that education compulsory, to ensure its preservation and efficiency. Individual efficiency, however, rests not only on education or intelligence, but is equally dependent on physical health and vigor. In the strenuous life of to-day, physical soundness and capacity, ability to stand the modern strain and keen competition, is of more importance than mental acumen or brilliancy in the race for material success. Education without health is useless. It is better for the child's happiness and success in life to sacrifice its education rather than its health. Education must comprehend the whole man, and the whole man is built fundamentally on what he is physically. Hence, if the State makes mandatory laws for education it should pass compulsory legislation to secure physical soundness and capacity. If the community permits or orders its children to assemble in public places at the age of greatest susceptibility to disease, under conditions which promote the possibility of infection, where certainly the opportunity for the spread of disease is greatly increased, and washes its hands of all responsibility for their physical condition and protection from disease, it is committing a social crime.

The child has as strong a claim on the State for its birthright of health and physical capacity as that for education and mental capacity. "When the State for its own protection compels a child to go to school, it pledges itself not to injure itself by injuring the child." Many pupils are backward purely and simply because of defective vision, defective hearing, adenoids, which may also cause deafness, enlarged tonsils, enlarged glands, or general malnutrition and physical weakness.

A report of a committee of the Canadian Medical Association appointed to study the question of medical inspection of schools says in part: "The scope of medical inspection should include the school building, its construction and architecture, the healthfulness and amenities of its site, its ventilation, lighting, and the methods used in keeping it clean and free from dust, its seating, cloak rooms, fire escapes, sanitary conveniences, gymnasium, baths and playgrounds. To be complete medical inspection should include the examination of the teachers." All these things are vital to the child's health and physical development. At the International Congress of School Hygiene in 1907, Oldwright, of Toronto, and Jessen, of Copenhagen, drew attention to the prevalence of tuberculosis among school teachers, and various observers in the United States have also commented on this aspect of school life. Any case of "open" tuberculosis in a teacher should be reported.

We are just awakening to the fact that a true knowledge and

observation of the laws of health, hygiene, sanitation, right living, our health environments, our warfare against uncleanness and disorder, disease and pestilence, are the greatest factors in human happiness and the struggle for existence. We are also just beginning to realize that the laws of health cannot be broken with impunity—that there is an inevitable penalty. The laws of health are the natural laws governing our bodies. Nature is very merciful and seldom imposes the death penalty without repeated warnings. But we do not heed the warnings. Many are possessed of the idea that they can violate the natural laws of the body and still enjoy that health and vigor which comes from observing them. At times nature seems slow to punish, but sooner or later exacts the inevitable penalty, whether the violations are due to ignorance or wilful disregard. To plead ignorance of the natural law does not avert the penalty.

Let me here include the following tables taken from the pamphlet issued by the Russel Sage Foundation on "The Relation of Physical Defects to School Progress." The children were from ten to fourteen years of age:

Physical Defect Present.	—Mentality—		
	Dull.	Normal.	Bright.
Carious teeth	42	40	34
Defective vision	24	25	29
Adenoids	15	10	6
Enlarged tonsils	26	19	12
Enlarged glands	20	13	6

Very many children have more than one of these defects, which would increase the number in the first column. About one in every two children has seriously defective teeth (90% have carious teeth); one in two has enlarged glands; one in four has enlarged tonsils; one in eight has adenoids. If we assume that the average child without physical defects of any kind will complete the eight grades of the public schools in eight years—a year to a grade—how long will it take the physically defective child to complete the eight grades?

Time for the normal child for the eight grades is 8 years.

PHYSICAL DEFECT PRESENT.

Defective vision	8 years
Carious teeth	8½ years
Enlarged tonsils	8 7/10 years
Adenoids	9 1/10 years
Enlarged glands	9 2/10 years

(Defective vision. Later disaster overtakes the child if defect is not remedied by glasses. It is a matter of common observation

that the brightest and most studious children have this defect.)

That is to say, the time required to complete the public school course is increased from $\frac{1}{2}$ to nearly $1\frac{1}{2}$ years for a single physical defect. To this cause, then, can be ascribed one, two or more wasted years of a child's life, besides the possibility of a permanent and irretrievable damage to its physical development, its beauty, and its efficiency. The futile attempt to impart instruction to pupils whose mental faculties are dulled by easily remediable physical defects is a national burlesque on ordinary common sense.

In our own schools at least 40% must be retarded by such defects, physical defects that could be so easily removed. Free health is now as radical as was free education. No child is now allowed to be ignorant, but disease and physical incapacity are both more contagious and more dangerous than ignorance. Health is more precious than knowledge, and public health is quite as important to the community as public education. A general knowledge and sane practice of the laws of health would revolutionize the world. If we can teach the child habits of healthful living, he will demand them at home, and the parents will receive the benefit of this new order of things. People will not be so afraid of "night air," "draughts" and open windows. The educative effect of medical inspection of schools should be seen in increased cleanliness and improved morals, for "cleanliness is next to godliness," and cleanliness and healthful conditions and environments always result in an uplift in morals.

The first school physician employed in America was in Boston in 1894. There are now about 1,500 employed in America and Canada. The first school nurse employed in America was in New York in September, 1902. On December 1st of the same year 12 nurses were appointed for the New York Schools and placed under the direction of Miss Lina L. Rogers. Now there are probably 600 employed in America and Canada. In New York, in 1902, before the advent of the school nurse, the school medical inspectors sent home 10,000 children. In 1903, after the advent of the school nurse, they sent home only 1,100.

The Wiesbaden System of Medical Inspection of Schools is very thorough, and one of the aims of administration is to reduce as far as possible the number of children allotted to each medical inspector and school nurse, with the object of securing more personal supervision and care. A responsibility devolves upon the parent as soon as he is notified by the medical inspector of any ailment or defect in his child, and the community, or the state, should see that this responsibility is met. It is a far cry from the detestable theory that "the child belongs to the state before it belongs to the

parents'' to the equally detestable practice of permitting a parent, through ignorance, prejudice, neglect, or simple obstinacy, to allow his child to be "a menace to the public health, a drag on national efficiency and a burden on the exchequer of the country." The suggestion that "it be made obligatory on parents to remedy all physical imperfections before their child can be registered as a regular attendant at school," should be a mandatory law—that the child be given that healthy, vigorous body it should have to prepare itself for its place in the State. It is the duty of the State to emphasize the importance of healthy and physical condition to education, and hence to the efficiency of the State. Such a mandatory law would produce wonderful results in the physical health and mentality of our race within a generation. If the parent is not able to procure this for the child, the State should stand ready to take the place of the parent.

So far, obvious disease and physical defect has largely occupied the attention of those connected with the administration of medical inspection of schools, yet the great and primary object should be prevention rather than cure. Although we recognize the importance of the removal of those physical defects, these great handicaps to school progress, we feel that our greatest efforts should be along the lines of preventive medicine, to educate the child in the art of living in a healthful way. Sir James Barr in a recent address on preventive medicine says: "The struggle for existence is not merely an individual question, but it is becoming more and more a national question, and the nation which produces the finest race is sure to win in the long run. What children usually die of is their parents, and what a nation dies of is lack of men. I am not now so much concerned about the prolongation of life as with the preservation of the health—a sound mind in a sound body; the former can scarcely exist without the latter.

"Ill fares the land, to hastening ills a prey
When wealth accumulates and men decay."

"Whatsoever thine hand findeth to do, do it with thy might, for there is no work, nor device, nor knowledge, nor wisdom, in the grave whither thou goest."

This is the child's century; the preservation of the nation lies in the preservation of the child. Sane forethought demands that this work for the child be largely along the lines of preventive medicine. Judge Lindsey, of Denver, says: "To say that the child is the chief asset of the State is short of the real truth; it is the State; it is, therefore, futile to oppose the movement going on in this country for the conservation of childhood on the ground that it is parental. The State has to be the overparent. It cannot escape if it would; it should not escape if it could."

Sir George Newman, Chief Medical Inspector of England and Wales, reports to the British Board of Education: "The conditions of life both in respect of personal hygiene and environment, which result in high mortality among infants under one year of age, lead at the same time to a high degree of sickness and disablement among children of school age; in the same way, and probably in greater degree, sickness and disease in children lead to disease and disablement among adolescents and adults. Every step, therefore, in the direction of making and keeping the children healthy is a step towards diminishing the prevalence and lightening the burden of disease for the adult, and a relatively small rise in the standard of child health may represent a proportionately large gain in the physical health, capacity, and energy of the people as a whole." Many breakdowns in later life are due to latent infection contracted in the schoolroom, or undermined constitutions and physical defects wholly due to neglect during school life.

Every child should undergo a complete physical examination at the time of, or as soon as possible thereafter, its admission to the public school, and the parent informed of any physical defect that will handicap the child in its school work. Parents should also be requested to furnish the child with a tooth brush and tooth paste. These are supplied at the school for the children of the poor for the nominal sum of 5c. each. The leaflet on "Care of the Mouth and Teeth" should be given to the parents at the same time. If on the first presentation of the child for admission, there is evidence of uncleanness and possible disease, the parent should be requested to take the child home again, clean it, brush it, and return next day at the hour the medical inspector will be present, for medical examination before admission. Even if disease be not present, this little trouble impresses the parent with the high value placed on cleanliness, the strict supervision of the child's health and person, and teaches her her responsibility in the matter.

So far we have aimed to have complete physical examinations of all kindergarten pupils, or "Entrants"; of all the graduating pupils, or "Leavers," and of all cases deemed urgent or "Specials" made during the year. With a full staff of medical inspectors we hope to complete all cases within two years, so that every child will be examined three or four times during its public school life, or once in every two or three years; that is to say, one-third to one-half of all the children attending the public schools will be examined each year. This means complete examination, testing of sight, hearing, heart, lungs, etc. All pupils are inspected by the medical inspectors three times a year, after New Year's, Easter and summer holidays, and by the nurses twice a month. This is called "Routine Inspection," the "Special" examinations are not complete, but

only for some physical condition or disease which demands immediate attention. The medical inspector marks these cases urgent, and it is the immediate duty of the nurses to visit the home, explain to the mother the medical inspector's diagnosis, and tactfully point out the desirability of the child having medical, dental or surgical attention at once. It is not permitted at these examinations to unfasten any clothing unless the mother is present. If a medical inspector wishes to make a more careful examination on the bare skin, it is his duty to request the mother to meet him at the school.

The careful medical inspection and examination of every child is the only sure foundation upon which preventive and remedial measures can be carried out. In many cases, I am pleased to say, a quiet, clear and accurate demonstration of the physical defects present in a child, a simple statement of the disabilities under which the child is suffering in consequence, of the great handicap to the child's school progress, is sufficient to induce the parents to procure medical, dental or surgical care without much delay. I regret, however, to have to state that there have been some cases of absolute refusal to relieve obvious suffering-marked cases of defective vision, adenoids, enlarged tonsils and septic mouths. Too often we find that the only sure and certain method of accomplishing anything for the child is careful, systematic and frequent inspections, and frequently and persistently demonstrating to the parents both the lesser and the greater defects and disabilities which so markedly handicap school progress, and interfere with its physical and mental development. The duties of the medical inspector call for something more than acknowledged clinical ability, keenness of observation and rapid and logical arrangement of signs and symptoms. Gentleness and affability gain the child's confidence; a missionary conscience approves a duty to the race well performed; an imagination that presents a vision of a race of beautiful women and strong men with sound bodies, healthy minds and clear intellects relieves the work of its monotony and inspires the eternal hope.

The real value to the child depends on the medical inspector's accuracy and thoroughness, his tact and sound judgment, for upon the reasonable presentation of facts will depend largely the possibility of prevention or remedy. One of the great difficulties of carrying out a thorough and accurate examination is the want of proper accommodation. Many schools are still without a separate room and the necessary equipment to do good work. The efficiency of the service must suffer until that is provided. To do accurate and satisfactory work by either medical inspector or nurse it is absolutely essential to have a separate room with sufficient heat, hot and cold water, quiet and freedom from interruption. Our

work must of necessity be done rapidly, and, therefore, proper facilities are all the more essential.

OUR RELATIONS WITH THE BOARD OF HEALTH.

These have been of the most helpful nature to each department. Its aim is to make the best use of its facilities to get control of communicable diseases, and our aim is to keep communicable diseases out of the schools, so that we all worked cordially for the same end. The Board of Health sends a list every morning to our department of the contagious diseases that have been reported to them, giving us the age of the child, the address and the school district. The principal and medical inspector of the school concerned are immediately notified from this office. Even if the patient is not a school pupil, the notification is forwarded that the principal, medical inspector and nurse may have an adequate idea of the prevalence of contagious disease in their school district. Any unusual prevalence in one district calls for an extra effort from the medical inspector and nurse to discover, if possible, the cause of the spread. All cases of contagious disease found in the schools by the medical inspectors are given an exclusion card, sent home, and the Board of Health at once notified. The Board of Health places the home in quarantine for the required time. In this connection, permit me to place before you for your consideration and deliberation the suggestion of the Chief Inspector of Halifax Public Schools, viz., the desirability of having the Department of Medical Inspection of Schools of the Board of Education represented on the local Board of Health.

OUR RELATIONS WITH THE MEDICAL PRACTITIONERS OF THE CITY.

We have done everything in our power to make this relation as cordial and harmonious as possible. Where any friction has occurred a statement of the actual facts has usually removed the irritation. Too frequently the statements of children have been taken without reserve or inquiry. Without any desire to make a false statement, a child may state something that was never done or said. The child gets its own idea from words or acts and states its conclusions in its own words as the statement made. Then, too, it is as natural for the child to magnify as it is for it to breathe. Nor do they closely follow everything that is being done. They may see the nurse use the wooden tongue depressor in one child's mouth, but do not observe that it is laid aside in paper ready at hand for that purpose, and another taken for the next child. I myself heard one physician say before a body of men that nurses were in the habit of using the same tongue depressor in the mouths of several children, which would be almost criminal if true. Another prominent physician stated that nurses make diagnoses. I have no hesi-

tation in saying that I believe these statements absolutely without foundation. Every case I have investigated has proved that the facts got twisted in travelling. I asked for specific cases from these physicians that I might investigate. I was told certain physicians had instructed their own children to observe and report, but so far I have not received specific complaints. The members of my staff have been instructed, if such instruction were necessary, that they must always have every proper ethical consideration for their fellow practitioner. Errors of judgment may occasionally occur, but the members of the staff have the same honest desire to promote the health of the city, and do their best for the protection of its citizens, as other practitioners. There is no class of men, in my opinion, no profession, so ready to support measures for the general good and protection of society, to support measures and disseminate knowledge that actually takes away from them their means of livelihood, as the medical profession. Yet I regret that we have to say here as has been said in other cities that "more criticism publicly expressed than could be called strictly ethical" was indulged in among a few medical men, of the bad diagnoses made by school medical inspectors. Our policy is conservative; it is better that a few doubtful cases be examined by the family physician than that any child should escape notice until irretrievable damage has been sustained. The medical inspector is instructed to make his examination sufficiently thorough to reasonably satisfy himself that disease or physical defect is present, or at least, that the condition warrants him in referring the child to the family physician for a more careful examination than he has the time or the facilities to make. Some of these cases may prove to be normal. In some there may be reasonable difference of opinion. Yet in a year's work, of all the complaints investigated, I found only one that appeared to have grounds for the complaint of a mistaken diagnosis. I believe both nurses and medical inspectors have invariably shown great patience, care, tact and judgment in their dealings with both pupils and parents. Medical inspectors have been informed that any attempt to use their official position to increase their own family practice at the expense of other practitioners will result in their instant dismissal. On the other hand, we regret that occasionally certificates have been given children of being under medical care where the evidence seemed to show that the practitioners had never seen them. In other instances the parents have reported the family physician looking into the child's throat and declaring "No diphtheria there," when a culture had proved the presence of diphtheria bacilli. We were not told that any explanation was given that typical clinical evidence of diphtheria may be absent when the bacilli are present; the bacilli are the danger to other children. One family physician took a swab

from a child's throat a few hours after the medical inspector, and his swab reached the Board of Health laboratory before the medical inspector's. The culture from the family physician was negative; that from the medical inspector was positive.

COMMUNICABLE DISEASES.

The Board of Health at the request of the Board of Education abrogated the rule that called for the closing of a school classroom where two children had developed diphtheria. This request from the Board of Education was the result of closing two rooms in the Parkdale Public School last fall. In this school we had an epidemic of diphtheria in which 80 cases of clinical diphtheria and diphtheria carriers were isolated. Almost at the outset a classroom was ordered closed under the old rule. Before the order could be carried out I had the medical inspector take cultures. In the time at his disposal before dismissal, he, with the assistance of the school nurse, took cultures of 27 children, and 10 out of the 27 proved positive and, of course, were quarantined. None of these cases showed the presence of exudate or membrane, and there were but slight clinical symptoms; only those children whose throats showed a slightly angry appearance were swabbed. But many later cultures were taken from throats that showed no evidence of inflammation present likewise proved positive, and the Board of Health placarded these as diphtheria carriers. This outbreak began with a child who had been home sick "with a cold" for a short time without medical attendance. Notwithstanding the mild attack, slight post-diphtheritic paralysis followed. The family physician being out of the city, the child was taken to another practitioner, who mentioned the possibility of the illness being diphtheria, but did not take a culture. The nurse found this child in school, and sent it to the medical inspector, who took a culture, and also cultures from two other children at home; all three proved positive. An effort was made at once to get control of the sources of infection. I sent four medical inspectors and four nurses to the school and the Board of Health promptly and rapidly furnished us with culture tubes. Altogether 335 cultures were taken, of which 80 proved positive. There was not one serious case of illness, and none showed the typical clinical evidence of diphtheria. Some five years ago a similar outbreak in the same school resulted in 13 deaths. In connection with this outbreak there arose considerable irritation among parents on account of the quarantine, because, as they said, "my child is not sick; it can eat three square meals a day." Perhaps the most striking thing in connection with this was the loud complaint of the father whose child was the probable source of the whole contagion. It still seems difficult to get the lay mind to grasp the truth that epidemics of disease are frequently caused by "well"

people carrying the contagion and spreading the infection. If the same horror existed for mumps, whooping cough, measles and chickenpox as is felt towards smallpox, and the same effort made to isolate the disease, these "childhood diseases" would be just as rare as smallpox. But what attitude can we expect from the layman when a reputable medical journal will make a statement like this: "If we are not entirely wrong in our notion of certain diseases, we think one cannot pass through life without contracting measles, chickenpox, mumps and whooping cough." "What's the use," if this be true! We may as well throw up our hands! It is this erroneous belief among mothers and grandmothers that makes it so difficult to control these contagious diseases. Many children have been excluded from the schools on account of these diseases, and the same evening the school nurse has found the infected ones playing with other children on the street. Exclusion from school is useless unless isolation is rigidly carried out. The best treatment for whooping cough is to keep the children in the open air as much as possible, and the family physician so informs the mother, frequently without impressing on the mother the necessity of keeping it away from other children to comply with the law. A deep and lively appreciation of our responsibility in the spread of disease and possible death to other children would do much to stop the prevalence of contagious disease.

There seems little doubt that the term measles conveys to most people the impression of a common disorder of childhood that is more of a nuisance than a disease. Considering that all authorities on children's diseases are agreed that measles is one of the most fatal diseases of early life, that attitude of mind is a very extraordinary—not to say unfortunate—circumstance. The mortality of large cities shows what a serious disease measles is in a community. Among the eruptive diseases it ranks third in the death rate. Yet this important fact seems never to have reached the public, and the mother who is told her child is suffering from measles usually is quite pleased it is nothing more serious, and has very little idea of treating the condition carefully and seriously. Last year the Lister Institute at Chelsea began a thorough investigation into the origin and spread of measles. This was made possible by the gift of a well-known English philanthropist, and the occasion brought forth the remark: "Rich men cannot devote their wealth to a better purpose than the furtherance of scientific knowledge which will help to rid mankind of a scourge such as measles, that in addition to the immediate suffering which they cause, levy a heavy toll on the rising hope of a nation, and therefore tend to undermine its efficiency." Year after year our children suffer from mumps, whooping cough, measles, chickenpox, smallpox and diphtheria! Where is the starting point? Neither

climate nor locality, *ipso facto*, can produce the disease. Death gathers its helpless little victims each year from every town and village, "we give our little ones to the destroyer and hypocritically and falsely acclaim 'God's will be done.'" It's the devil's will that has been done, through our passive co-operation, through our unintelligent, criminal inactivity. Children's lives especially are so frequently sacrificed to ignorance, prejudice, or neglect. It has been remarked that it is easier to pray than to work, and it certainly does seem that it is easier to pray than to fight disease in the sane light of modern scientific knowledge. Disease means uncleanness and unsanitary conditions and habits in the community, in the home, or in the school. Under these conditions it is imperative to put children in the best physical health possible to protect them from disease. Sir James Barr says: "It will be very difficult to prevent the spread of infectious disease among children so long as we have overcrowding, defective ventilation, dust, want of cleanliness, in the homes, schools and public conveyances. A great deal can be done, however, for local conditions by looking after the children's teeth, by seeing that their teeth and jaws get plenty of exercise in chewing food, by keeping their mouths and nasal passages as clean as possible, and by removing any obstructions, such as adenoids and enlarged tonsils." Children who breathe through the mouth are peculiarly liable to disease. Under ordinary conditions there is no excuse for absence from school, but sickness or physical defect. If a system of notification could be worked out whereby all principals must be notified by the parents not later than the third day of a child's absence from school of the cause of such absence, the difficult task of keeping control of communicable diseases would be made much easier. All cases of *neglect and not reported*, or cases where there was even the suspicion of communicable disease could be visited by the school nurse and reported.

OUT RELATIONS WITH PRINCIPALS AND TEACHERS.

These have been most cordial. Our work is greatly facilitated by their hearty co-operation. The principals have invariably been most courteous in freely offering the use of their offices to the school nurse and medical inspector. Only in a comparatively small number of schools have we a separate room for the nurse and medical inspector. I hope we shall soon have this in all our schools, as the difficulty of efficient and thorough work is greatly increased by lack of this facility. I find that the principal who is able to tell me of the improved tone, brighter and cleaner appearance, and increased self-respect among his pupils is the principal who has been an enthusiastic supporter of the school nurse and medical inspector. It is to be regretted that all have not been enthusiastic. Some few

have, perhaps, failed to appreciate the magnitude of their added opportunities of doing good, and of being a real benefactor to their race. "Teachers who are at all enthusiastic as to hygienic conditions, will take care that cleanliness of floors, walls, windows and school furniture is maintained; that air inlets and outlets are never entirely closed winter or summer; that *all* windows and doors are open to their fullest extent whenever the classrooms are empty. Nor will their interest stop at this point, for they are sure to exert a beneficial influence over the personal condition of the scholars and their clothing. Without their active and intelligent co-operation all medical suggestions for improving the health and physique of the children are rendered more or less of no avail. Many who were passive at first are now our most active coadjutors, but there are still some who fail to see the benefits ensuing from medical inspection and take no more part in this work than they are obliged to. The majority, however, are doing all they know to further our aims, and we gladly record this appreciation of this great help. Many of them are enthusiastic, and the amount they do for the children is astonishing. It is only right that with the generally admitted improvement in the condition of scholars following upon medical inspection, we should acknowledge the sympathetic aid of the teachers."

It is now becoming less necessary to impress on teachers the importance of the physical condition of their pupils. Even casual observers readily see what a great factor health is in school progress. It is, perhaps, not so easy to make them fresh air enthusiasts and show them that a low temperature in the classroom promotes mental activity—that a temperature of 64 degrees is better than a temperature of 68 degrees.

THE SCHOOL NURSES.

The first regular employment of trained nurses in connection with work of medical inspection of schools was begun in New York City by Miss Lina L. Rogers, our present Superintendent of Nurses, in 1902. During September and October of that year Miss Rogers worked alone, and in November she was given charge of 12 nurses. The improved results in the schools supervised soon led to the appointment of nurses in all schools. Since that time experience has proved that medical inspection fails to produce results without the trained nurse, and the best developed systems have two trained nurses to one medical inspector. Nurses are essential to systematic follow-up work, and it is only by follow-up work that anything is accomplished for the child. The nurse becomes the instructor of the pupils and parents and teachers in the principles and practice of sane hygiene. She becomes the link connecting the home with the school. I think, without exception, the teacher

always welcomes the school nurse, although they occasionally have rebuffs in the home. Nurses are especially helpful in reducing the number of exclusions for minor contagious skin diseases and infected heads. Those that are excluded she follows to their homes at once, and sees that treatment is begun. She has been a great help to the teachers in guarding the school from such epidemic diseases as diphtheria, scarlet fever, measles, chickenpox, mumps and whooping cough. Many cases are first discovered by her visit to the home, and brought under proper supervision. Many mothers have expressed to me their deep appreciation of the assistance the school nurse is to them in teaching their children habits of cleanliness, daily brushing of the teeth, and neatness in the care of their person. Many a mother, too, has reason to bless the school nurse as an angel of mercy who has sought out a stricken home, comforted and relieved the sick children and overtired mother, advised, directed and brought order out of untidiness, uncleanness, discouragement and distress. The school nurse has interested herself in the home, brought food and fuel, boots and clothes, and made it possible for the children to get back to school. *The Lancet*, one of the foremost medical journals in the city, says: "The public school nurse in Toronto is doing much good. The patients that come to the hospitals for treatment present a much cleaner appearance than formerly." The City Relief Officer, Mr. Coyell, informs me that the school nurses are always careful in the cases they recommend for relief. They find out the number in the family, the number working, the amount of money earned, and the rent paid, before any action is taken. A prominent minister reported to us a family in connection with one school who were in distress and asking for relief. The case was turned over to the school nurse, who found out—how, I do not know—that the family in question had a bank account. Needless to say they were not recommended for relief.

Miss Rogers has established a post-graduate course of one month for nurses who wish to take advantage of this opportunity to familiarize themselves with this branch of nursing. No fee is charged for the course, and the nurse gives her services free. A nurse taking this course works with one of the regular staff until the work is familiar to her, and is then given charge of work for which she is solely held responsible. This enables her to assume the responsibility that naturally falls upon her when starting work in a new field. Nurses from Canada and various cities of the United States have taken this course. The nurses now in charge of school work in Galt, London, Ottawa, Kingston, Niagara Falls and Stratford took their first training in school nursing under Miss Rogers here.

The school nurses have given regular lectures to the domestic

science classes on first aid and simpler forms of nursing. Lectures are given at mother's meetings. The school nurse also treats, under direction from the medical inspector, such minor contagious diseases as scabies, favus, ringworm and impetigo in children whose home conditions are such that it is impossible to get even the simplest directions carried out thoroughly. In this way many children are kept at school, or are enabled to get back to school much sooner than would be possible any other way. They are charged, too, with the duty of inspecting children's heads, and the elimination of pediculosis. Especially among the foreign children this is no easy task, and there is the discouragement of always finding so many children reinfected after the holidays. It is remarkable, however, how the children strive to keep clean under the smile and encouragement of the school nurse.

No aspect of the problem of the physical condition of the children is of more importance than that of cleanliness, and the training of the child from its infancy in habits of cleanliness increases the health of its body, increases its self-respect, increases its physical and mental capacity, raises its moral standards, and give to it the ambition to be a useful and respected citizen, while verminous heads and bodies, and the general uncleanness usually accompanying these, lead to ill-health, physical incapacity, inefficiency, immorality, and crime. Disease and crime thrive in dark and dirty places. Every school should have a well-equipped lavatory that the pupils might avail themselves of such facilities for washing, or sent there for that purpose in cases of neglect. This not only cultivates cleanliness, but also teaches it. The child is not only kept in good health, or at least greatly benefitted thereby, but also carries with it through life the lesson of cleanliness learned at the school. An English writer says: "We are much behind the continental countries in our school structure and standard of cleanliness of our school children. In Germany the school baths is a recognized part of the school building, and no town having a public water supply is without the bath in its public school. An installation of shower baths need not be any great expense, and every school should have regular bathing of all school children." The influence of the bath on general health and capacity is too obvious to need demonstration, and there can be no doubt that bathing is a true economy. Make the child feel the discomfort of uncleanness by making him feel the comfort of cleanliness.

It is surprising the small number of school children that carry a handkerchief, and remarkable the small number that know how to properly use one. Ninety-nine children in a hundred will simply remove the external discharge without attempting to clear out the nose. They must be taught, and the teaching is so frequently

neglected. I have suggested that bales of cheap cotton be purchased and torn by the nurses and teachers into small lengths convenient for use as handkerchiefs. These could be used for the day at school, and then burned. Besides giving that attention to the nasal passages they should receive, it would teach the child the ever-needed lesson of personal cleanliness.

Even if these and other lessons on the art of healthful living are taught in the homes, the teaching of them in the schools would be a great help in inculcating habits of right living, for children must have daily repetition and admonition. A child has to be told every day to say "Thank you" if the habit is to be formed. The school nurse visits these children in their homes also; teaches the mother to clean and bathe them, how to get them free from vermin, instructs them as to proper diet, the best general care, and makes an effort to induce them to clean up the house, open the windows, and let in fresh air and sunlight. But what can be accomplished comes so far short of what needs to be done that it is no wonder the workers are sometimes depressed. In these cases, as in so many others, what an inestimable benefit would be a well-equipped bathroom in the school.

Malnutrition is one of the most important physical defects from which children suffer; in early life it results in the high infant mortality among babes, and in later life in pulmonary tuberculosis, or other constitutional disease. These cases require more careful individual study and efficient "follow-up" supervision, as home conditions of feeding, ventilation and care are invariably bad. Many causes usually contribute to malnutrition, poverty, uncleanness, impure air, improper diet more frequently than lack of food, carious teeth and septic mouths, adenoids, enlarged tonsils and glands, and often the impossibility of material care.

Defective vision is becoming more and more prevalent. The left eye is said to be more prone to defect than the right, and girls more prone than boys. It is exceedingly unfortunate that parents so often look upon squint as more a defect of beauty than anything else. The neglect due to this belief frequently results in marked defective vision and even blindness. There is no doubt the Board of Education has rescued many a child from partial or complete blindness by enabling us to supply glasses to urgent cases when the parents were not able to pay for them. I regret to report that we have had a few cases where parents refused to supply glasses to their child, although quite able to pay for them; we were told it was none of our business. It cannot be too strongly insisted upon that the provision of glasses is only the first step; the need of frequent periodical re-examination is very important.

Another condition that is frequently neglected is discharging ears. A child catches cold, which results in middle ear suppuration, and destructive processes are allowed to continue there perhaps for years, with infrequent abortive attempts to get the condition cured, until the child's life is endangered as well as its hearing, and the somewhat serious mastoid operations has to be performed. In some of these long-standing suppurative cases, three of the medical inspectors took cultures from the discharging ears, and diphtheria bacilli were found in some cases. For six years one child had been a constant menace to other children. Cases of deafness resulting from neglect such as this and other cases have been tested by the McCaillie Audiometer to ascertain the degree of deafness with a view of seeing what could be done for them. Other causes of defective hearing are impacted wax and adenoids, where the remedy is easy and simple, but, sad to relate, too often neglected, for adenoids frequently result in serious permanent injury.

Adenoids are the chronic enlargement of the lymphoid tissue behind the nasal air passages, which they obstruct, and greatly interfere with breathing through the nose; they may also grow over the entrance to the ear canal or eustachian tube. Hence, we have as a result mouth breathing, profuse discharge from the nose, deafness, cough, twitchings and nervous disturbances, even "night terrors"; later in life, if the condition is not remedied, considerable deformity of the face and mouth is the result; the high arch of the roof of the mouth, contracted and undeveloped jaws, and the crowding and irregular projection of the second teeth; there is also more or less mental dullness and retarded physical development. Among only six children in attendance at the Island this winter, I found one typical case, a boy between 8 and 9 years old, who had almost all the defects mentioned. Naturally these children are behind in their school progress; they become listless, inefficient and uninterested in school work, and are always more liable to disease. Enlarged tonsils are practically always found associated with adenoids, and frequently also enlarged glands of the neck. Even after the removal of adenoids and tonsils children should be taught to breathe through the nose, for the mouth-breathing habit has been formed. Frequent simple breathing exercises with the mouth closed given by the teachers or nurses would impress on children the importance of correct breathing, and teach them the habit. They should also be taught the use of the handkerchief, and how to properly clear the nose. This care of the nose and throat should be given serious attention, to avoid the formation of those chronic catarrhal conditions so frequently found in our cold, moist winter climate. . . .

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THE OPEN AIR SCHOOL.

These were first started in this country in Providence in 1908. The difficulty or uselessness of trying to cram a child's head full of knowledge that had an enfeebled, poorly nourished, or sick body was long ago recognized, but we have been slow to apply the remedy. If education or health has to be sacrificed, sacrifice the education. It is rare, indeed, that we have to face such an absolute alternative. In open-air schools the first consideration is given to health. In these schools are placed the physically undeveloped, poorly nourished, underfed, anæmic, pre-tuberculous children: the children who will otherwise be physical weaklings, who will fill the class of the shiftless and thriftless, fill the reformatories, the hospitals, the sanatoria, the shelters, and the asylums, make the loafers and criminals of adult life, who never had the asset of a healthy, vigorous, clean body, or knew the inspiration of a clean mind. This child is taught how to live. He learns the invigoration of health; he learns to abhor stuffy rooms, in the home as well as in the school; he feels the stimulus of the open air, sunshine, the bath and personal hygiene; he feels the joy of health, the inspiration of mental and bodily vigor. Sir George Newman says: "The individual attention given to the child by the nurse and teacher, the opportunities for bathing and personal hygiene, the adequate meals, the rest hour, the special arrangements for physical training, engender and foster habits of personal cleanliness and health difficult to secure in the crowded conditions of the ordinary day school, and, in this way, open-air education tends to restore the enfeebled body to a normal condition of nutrition and energy, helps to dispel many of the nervous conditions incidental to child life in towns, and serves as a most valuable adjunct in the prevention of all forms of constitutional disease, including tuberculosis." The open-air school is preventive medicine. The ideal situation for these schools is the open woods and parks. This involves the costly and difficult problem of transportation; these difficulties are not insuperable, and such schools are now established in many countries of Europe and America; Germany gets the credit of making the beginning. In this country, besides Providence, Boston, New York, Chicago, Hartford, Montclair, Washington, Orange, Newark, Albany, Cleveland, Rochester, Buffalo and other cities have established the open-air school. Advocates of the open-air school and the open window class room, the advocates of health first, education second, believe the great school duty is to give the children vitality, resistance to disease, and the natural desire for learning which the well child always has. In Chicago, New York and Buffalo such open-air schools were established on the roofs of buildings. Cleveland has no less than eight open-air schools, and reports: "The new Eagle School provides for four open-air classes on the roof,

reached by electric elevators. Ample playground, protected by heavy wire netting, gardens, shower baths, rest rooms, toilets, medical dispensary, and a large dining room with kitchen, provide all essentials requisite for this type of pupils in an ideal open-air school. The results so far obtained in our open-air schools amply justify the wise provision for the establishment of these schools by the Board of Education." Why is it Toronto cannot provide similarly for such open-air classes? Can we not do as well as Cleveland or any other city to save our children? Certainly it will cost money, but it will not cost as much as these same children will cost Toronto a few years hence for their maintenance and care in hospitals and other institutions. In Cleveland suitable additional clothing, wraps and sleeping cots are furnished by the "Anti Tuberculosis League," and suitable food by the "Federated Women's Clubs." These classes are, of course, ungraded, and should not have more than twenty pupils. Special clothing is always necessary. That now in use is "The Study Bag" and "The Eskimo Suit," with caps and toques and large felt boots. The open-air school is one of the great handmaidens of preventive medicine. It is the vanguard in the war against the Great White Plague; the open-air school produces physical vigor and increased mentality; redeems from uncleanness, disease and immorality; reduces incorrigibility and criminality; produces pure manhood and womanhood, efficiency and self-respect, and demands more money and attention than has been given to open-air schools in the past. If Toronto is not to lag behind in a sane appreciation of preventive measures that promote the general health of the city, and save children from disease, immorality and crime, the Board must take up the question of the establishment of open-air schools without delay.

The death rate from pulmonary tuberculosis among children under 15 years of age is greatest in the first five years of life. The diagnosis is frequently post-mortem, the disease being unrecognized during life. The symptoms during early years are frequently too indefinite to make a positive diagnosis. Autopsies on children dying from other causes have so frequently shown tuberculous lesions that it seems pretty well established that children are extremely susceptible to tuberculosis. Dr. Phillips, of Edinburgh, says: "Evidence is rapidly accumulating that it is especially during childhood and school life that the tuberculosis seed finds a nidus. The typical and well-defined signs of tuberculosis in the adult are not frequently found in children. Pulmonary infection is frequently secondary to infection of mediastinal or bronchial glands. In the absence of sputum containing tubercle bacilli, in the absence of definite local signs, but where the general condition arouses strong presumptive suspicions, it is good judgment to treat the child as if it were infected. These doubtful cases should be as

frequently re-examined and are carefully watched as those in which the diagnosis is positive. The weekly weighing of these children is of great and real value. It is not only positive evidence of gain or loss, but gets the children interested in their own physical welfare. They are anxious to see an increase in weight, and this anxiety will make them give more heed to advice as to proper diet, fresh air, exercise, rest and sleep. In the case of the school medical inspector, the difficulty of making a positive diagnosis in these cases is greatly increased by the fact that he never examines the child on the bare chest unless the mother is present. But we have a great aid in the weigh scales placed by the Board in every school. If used for no other purpose than to keep a record of these poorly nourished children that furnishes us with some guide in our care of them, the outlay for the scales was abundantly justified. I know of no city in the world but our own where the medical inspection system has a weigh scale in every school. Last fall Vancouver Board of Education was reported as "about to place weigh scales in every school," but I do not know whether this was done or not. We have been greatly assisted in efficient supervision of these children by the Heather Club Clinic under Dr. H. C. Parsons, at the Hospital for Sick Children. All open cases of tuberculosis have, of course, to be excluded from school, and a careful and regular supervision is kept over closed and doubtful cases. In nearly all these cases the home conditions are bad; there is uncleanness and improper diet, an ill-ventilated, poorly lighted bedroom, and late and irregular hours for sleep and rest. These children furnish the tuberculous cases treated at our numerous sanatoria. Immense sums of money have been spent on sanatoria for consumptives. Why not cut off the supply by seeing that these children do not develop tuberculosis. Any humanitarian scheme for the prevention of tuberculosis must necessarily be conspicuously inadequate and incomplete if it does not begin with the life conditions of the child in the home life and in the school, the school life being just as important as the home life. In many cities volunteer social workers are enlisted to help in visiting the homes that a more constant supervision may be kept over the children. The school nurses are doing this now, but of necessity their visits cannot be very frequent. The parents are aroused to the danger; they are encouraged to clean up the home, open the windows and begin a new life. It is new life—health—strength, ideals, morals, hope!

The great reward for the workers is the sight of what a little daily human encouragement, help and intelligent direction will accomplish! The brighter faces, the light of hope, cleanliness and order where uncleanness and disorder reigned, human beauty unmarred by filth and grossness, the dawn of a New Life!

I hope you will see your way clear to appoint a committee to plan for the establishment of open-air schools at the earliest opportunity. This is an urgent need and should no longer be delayed.

DENTAL CARIES.

Many cases of badly decayed teeth, unclean mouths and inflamed gums, are pitiable and depressing to look upon. With pus continually exuding from decayed teeth, with chronically inflamed gums, coated tongue, foul breath, profuse nasal discharge from adenoids or polypi, indigestion, constipation, and all the symptoms of neglect, how is it possible that the little tots come along as well as they do! Nature makes a magnificent struggle, under every disadvantage, to give health and strength. The constant evidence of neglected teeth and unclean mouths is heartbreaking when one has the vision of the disastrous though preventable results on the child's well-being and physique; when one can see facial deformity, poor physical development, ill-health, inefficiency, criminality or death! Dental decay is only hastened, of course, by the tendency of so many parents, especially foreigners, to feed the child on soft foods, cookies, cake, pie, candy and all-day suckers. To get these children brushing their teeth daily, to teach them even some personal cleanliness, to induce them to stop eating so much candy, and to eat, instead, wholesome food; to induce them to quite drinking tea and coffee, the school nurse and medical inspector need all their courage, wit and ingenuity. Their difficulties are increased by the common aversion of the mother to take the child to the dentist, because "it will hurt!" The child is even allowed to suffer toothache because of this so-called tender-heartedness. A foul mouth is usually a greater danger to the individual who owns it than to anyone else. Any septic condition of mouth increases the virulence of disease organisms, so that the child is not only more subject to disease, but more likely to have a severe attack. The following is a report of the dental inspector of two classes examined in one school:

Much has still to be done to spread true ideas of the care of the teeth. There are still many parents who think it absolutely unjustifiable to spend money getting temporary or first teeth filled. At the Royal College of Dental Surgeons many of the poor children have had their teeth cared for, and a number of private dentists have generously given their time to relieve urgent cases. The Dental Inspector has started to hold a clinic once or twice a week at the Royal College of Dental Surgeons, to remove roots, badly decayed teeth and temporary teeth that are causing irregular eruptions of secondary teeth. He has had one clinic in a school, and the principal is now so enthusiastic over the good results he wants a dental chair established in his school. There is much still to be done, and we are anxiously looking forward to the early installation

of the dental chair in Earls court School. The principal of Queen Alexandra School has expressed the strong hope that he may be enabled to instal one there. The principal of Roden thinks he could keep a dental chair busy the year round from his own school. Any philanthropist who has \$500 to spend for the betterment of his fellow-beings could not confer greater benefit or attain greater fame than by giving his money and his name to a school dental chair. At a recent meeting of the British Dental Association at London University, the consensus of opinion expressed was that the establishment of school dental clinics appeared to be the handiest, best and most economical means for caring for carious teeth of school children. Germany and Sweden are leading the way in the establishment of school dental clinics.

It is distressing to find so many children with their first four permanent teeth decayed beyond the possibility of caring for them—"the six year molars," which appear at about six years of age or very shortly thereafter; so many parents take them for teeth of the first set, and consequently they are neglected. The Dental Inspector has delivered lectures to nurses, teachers, parents and pupils at different times during the year. He has also prepared a very creditable oral hygiene exhibit, with illustrations showing conditions and deformities that result from neglect of the teeth. These will be placed in all the schools. I noticed the statement that there were more of these oral hygiene charts to be seen in the schools than maps of the world. It is much more important for the child's physical and mental development, his future physical and mental efficiency, success and happiness, to have a thorough knowledge of what is on those oral hygiene charts than any knowledge he can obtain from maps of Europe, Asia and Africa.

At three years all the temporary teeth should have erupted, and at twelve or thirteen the second teeth are all erupted except the wisdom teeth, which emerge from eighteen to twenty-one. Parents should look upon these two sets of teeth as essential to the child's physical welfare—essential if the child is to have a healthy body and sound mind. This should be a parent's first duty, paramount over all others, for without health and sanity what is there left in life. Our children suffer throughout all their lives with weakened bodies and enfeebled minds, from physical incapacity, defective mentality, or insanity, because of our maudlin sentimentality, stupidity, carelessness, or neglect. In Germany the first municipal infirmary for school children began work in Strasburg in 1902. Now 33 German cities have a school dental clinic. Thanks to the influence of these, not only the authorities and well-informed classes, but also the poorer classes, now understand the importance of the proper care of the teeth. By the inspection of 15,000, it

was shown that 90 per cent. of the children had carious teeth. It is imperative that school children should be taught the importance of preventing decay by brushing and cleaning and having cavities filled. The school nurse, the school dental inspector, the medical inspector, and the school dental clinics have done much to educate parents and pupils and teachers of the value of constant care of the teeth by the noticeably increased physical strength and intellectual capacity of the children.

The early loss of teeth is sure to produce some serious disability in some form or other sooner or later. No single ailment of children is responsible, directly or indirectly, for more feeble constitutions, disease, physical maldevelopment, and mental dulness than dental caries. There is no doubt, also, that frequently defective teeth are the primary cause of enlarged tonsils, adenoids, and enlarged glands. There is nothing gives greater or more satisfactory results than early attention to the teeth.

Children learn early the comfort of cleanliness. The mouth is kept clean and free from chronic inflammatory conditions; the teeth are preserved, and the necessary capacity for mastication to secure proper physical development and good health retained; even the self-respect of the child is increased, and hence the moral tone uplifted. The early treatment and proper care of the teeth probably gives greater results along the lines of preventive medicine than similar efforts in any field of medicine or surgery. . . .

Let me conclude with the following from the pen of Dr. L. H. Guest of the London County Schools: "If you are severely practical you are conjured not to hear 'this cry of the child'; it will not be 'practical' until to-morrow, when some of the preliminary work of clearing out the awful morass of slum child life shall have been performed. To-day it is only a dream. A dream of the time when the child at school shall grow as sweetly and as happily as a flower in a garden, when it shall stretch up its mind for knowledge as a flower for sunlight, and when all the strange and impish deformities and etiolations medical inspectors have to catalogue are relegated to infrequent hospitals and sanatoria with but few beds in their wards. All these things are within the sphere of the school doctor, all these things are within the scope of present-day medical knowledge. The knowledge is here in reality, it is only the accomplishment in fact that is in Utopia—to-morrow." . . .

MASTICATION.

F. C. HUSBAND, D.D.S.

Read before the Technic Club, Toronto, November, 1912.

THE oral cavity being the field to which we, as dentists, devote our daily energies, it is reasonable to suppose that we should value its uses more highly than any other branch of the healing art. Research and experimentation by a body of scientific professional men has established the fact that this cavity is the main avenue of bodily health or disease. Its cleanliness is not to satisfy the aesthetic, but is a hygienic necessity to reduce micro-organic life and its products to a minimum and to so maintain the vigor of the hard and soft tissues that they may be conditioned to withstand the ever-ready attacks of disease.

The mouth, then, is one of the most important orifices of the body. Being controlled almost entirely by the will, it has become more neglected, ill-kept and improperly used than any other. Only too often does the careless subject wake up to the fact that the masticatory apparatus, intended for a lifetime of usefulness, is fast disappearing. Nature has given us a denture of exceedingly hard texture, and the logical conclusion would seem to be that it was intended for hard work, and that neglect, both as to function and cleanliness, would result in its degeneration. Such indeed is the case. The normal function of the masticatory apparatus has been so ignored and forgotten that a problem of conservation, quite alarming, now confronts us. Cease to use an organ and that organ atrophies. Cease to use the teeth and they become irregular and fall victims to caries and pyorrhea. That is their way of atrophying.

The conservation movement that has been started to deal with these ravages of decay and dental deformities will hope to instil into the minds of the public the necessity of not only observing cleanliness of the masticatory organs, but the proper and thorough use of these organs.

Of what avail is legislation to obtain pure food products and pure water if these things are immediately contaminated the moment they enter an unclean mouth?

All the benefits of cleanliness in preparation are immediately undone the moment this food enters the unclean mouth, and this condition, coupled with faulty and insufficient mastication, interferes seriously with metabolic results.

In primitive times, when foods were coarser and required the vigorous use of the jaws and teeth, there was little need of such hygienic movements as we have to-day, little need for dentists, and the bodies of these primitive people were stronger and disease less prevalent.

The present methods of preparing foodstuffs that appeal to the eye and palate and that require a minimum of time to consume have a strong tendency to allow the teeth to fall into disuse to a great extent. Little thought is given to the fact that only that portion which is digested is the tissue builder. Little thought is given to the fact that quality counts rather than quantity—that food improperly masticated, *i.e.*, thoroughly comminuted and thoroughly mixed with saliva and acted upon by its digestive ptyalin, will never be thoroughly digested, but will act to a greater or less degree as an irritant to the digestive tract.

In 1860 Mr. J. R. Mummery of Great Britain carried on a series of examinations of the skulls of many ancient and primitive races for evidences of caries. Some of these various tribes lived almost entirely on meat, others subsisted on a mixed diet of vegetable products and meat, and still others lived mainly upon vegetables. In all races examined some evidences of caries were found, but the total percentage, compared with that of to-day, was very low, being less than 25 per cent.

Mr. Mummery also observes that those people living wholly or in part on carbohydrate food were more disposed to dental caries than those relying almost entirely upon meat for food, and that in the advance of civilization the tendencies towards decay of the teeth become greater.

In the present age we are subjected to influences that our forefathers never dreamed of. In our mad rush for mental development nature's laws are transgressed, and the fact is largely overlooked that to have a really healthy, vigorous mind one must have a healthy, vigorous body. A diseased and deformed and ill-fed body cannot possibly possess a powerful mind.

Of the evils most harmful to longevity and posterity, the most insidious is the modern method of preparation of our food material for use. Their softened substances do not force us to masticate, and our habit of getting the most with the least amount of effort allows us to swallow the bolus before the necessary saliva has been mixed therewith. The saliva does not flow as it should because the necessary mechanical forces are not brought to bear on the glands, which forces are the vigorous action of the jaws, tongue, cheeks, etc.

This habit of bolting is a pleasant one since the nature of the preparation of the food gives us an appetizing morsel. So it is that the breaking of the habit will be found difficult.

The adult who has from childhood thoroughly masticated his food will be found, usually, to have all parts of the oral cavity and adjacent parts well developed, with regular nasal passages spacious, mucous membranes strong and healthy.

The habit of masticating cannot be too early taught the child. The physiological worth to the development of the hard and soft tissues within the oral cavity, the essential stimulation to the developing facial bones, the glands and lining membranes in and adjacent thereto, and its indispensable value to further digestion are facts that demand our earnest attention.

Carbohydrates are the chief foods made soft by cooking, and while in this condition they are more readily acted upon by the saliva and its digestive ptyalin. Still they are readily bolted and there is but little excitement to cause a rich flow of saliva. So in the vast majority of cases these carbohydrates pass on unacted upon, except to a slight degree, by the ptyalin, which is the only enzyme that has any digestive action upon carbohydrates.

When saliva is demanded in quantity it becomes more strongly alkaline, and thus not only aids digestion, but prevents bacterial fermentation of deposits remaining after deglutition.

Great exertion of the muscles of mastication excites the flow of lymph, the requisite for salivary formation, and the hardness of the material crushed within the oral cavity, together with the muscular force required, stimulates the flow of blood to the gums and alveolus, where its abundance is so necessary in the rejuvenation of the tissues.

The vigorous use of the teeth and muscles of mastication by the child produces marked development in the facial outline, the jaws, and the roots of the teeth, as well as producing a thick, tough alveolus. Where this development does not take place due to neglect, we usually find irregular teeth, constricted palatine arches, ill-developed nares, no straight septum with generous passages and regular, well-defined turbinates.

When these conditions obtain pathological conditions of the mucous linings throughout the respiratory tract supervene, the narrow nasal passages are inadequately drained, causing inflammation. During the ages from four to sixteen the glandular tissues of the posterior part of the naso-pharynx become hypertrophied,

forming adenoids. This condition interferes with the free passage of air to the lungs, and mouth breathing results. With the mouth habitually open the lateral pressure of the tongue is lessened, while the buccinator muscle is drawn more tense, and the result is a narrowing of the jaws. Further, the air is not conditioned to enter the lungs, there is dryness of the mouth and throat, augmenting the action of caries, the mucous membrane is kept irritated, and there is developed a good field for the tubercle bacillus.

The development and maintenance of the salivary glands is the result of great muscular activity. The health and strength of their secretions depend upon the flow of blood and lymph in sufficient quantity. During inactivity the flow of lymph almost ceases.

Thought or sight of a tempting morsel causes a flow of saliva and gastric juice. This sense is called appetite, and is the voicing of the body's requirements.

Fletcher has demonstrated the wisdom of keeping the mind on the taste of the food and masticating until we involuntarily swallow such foods as the appetite craves. There will then be no over-indulgence, but the desire for food will depart just as soon as the requirements of the body are met and not later. There can be no indigestion. No media is present in the intestines to develop bacteria, and pathogenic organisms that have escaped the saliva and gastric juice are rendered inactive or die for want of sustenance.

In the long course that food must take in the effort towards tissue building the parts under voluntary control are the terminals only. When the food has passed through and beyond the first three inches of the digestive tract all voluntary treatment ceases.

To the growing youth of to-day is anything dealing with the body's development of more importance than thorough mastication?

ALLOY FOR CASTING CROWNS.—An alloy consisting of 95 per cent. of pure platinum may be used for the crown casting when it is to stand alone. In case the crown is to be used as an abutment for a bridge an alloy of 90 per cent. pure gold to 10 per cent. platinum is preferable because of its greater strength and consequent resistance to the force of mastication. In the fusing of these alloys a nitrous oxid blowpipe is used in order to furnish sufficient heat to accomplish the result desired. A pressure of ten pounds is enough for the casting of crowns.—H. E. S. Chayes, *Dental*

DR. A. M. CLARK, WOODSTOCK, RETIRES FROM R. C. D. S. BOARD

DR. A. M. CLARK has indicated his intention of retiring from the Board of Directors of the Royal College of Dental Surgeons of Ontario at the conclusion of the present term. He has served on the Board as Representative of District No. 5 for the past twenty years.

When one considers that the Ontario Board is not only a Board of Examiners, but also the governing body of the School of Dentistry of the R. C. D. S., the importance of the service that has been rendered the profession by Dr. Clark is the more appreciated.

The profession owes much to the men who have piloted the dental barque through the many vicissitudes of the past decade. Throughout this period Dr. Clark has been in the forefront of every movement that has meant the advancement of dental science and education and the raising of the status of the profession.

He was a member of the committee that had in charge the erection of both the old and new college buildings. He has been a member of the Discipline Committee since its formation and chairman of the Committee of Examiners throughout his entire membership on the Board. From 1893 to 1899 he was Treasurer of the Board, and President from 1899 to 1901.

Born in the County of Wellington in August, 1859, and educated at Rockwood Academy and Collingwood Collegiate, Dr. Clark may be properly said to be a true Canadian product. After teaching school at Burlington for a few years he entered the office of the late Dr. Wm. Foster of Guelph, and graduated from the Royal College of Dental Surgeons in the spring of 1886.

Since graduation Dr. Clark has resided in Woodstock, where he continues to enjoy the confidence and esteem of all the citizens. Dr. Clark has not only been a leader in his chosen profession, but a man of wide interests and a good Canadian citizen, as his many public activities clearly show: Past President of the Woodstock Hospital Trust, an active member of the Canadian Club, member of Trustee Board of Knox Church, a thirty-second degree Scottish Rite Mason, and Past Master of the Oxford Masonic Lodge.

Dr. Clark was but recently elected President of the Woodstock Amateur Athletic Association, and is actively interested in the local curling and bowling clubs, which seems to indicate that the subject of this sketch feels just as young and vigorous to-day as ever he did.

We heartily congratulate Dr. Clark upon the twenty years of faithful service he has so unselfishly rendered the School of Dentistry and the Royal College of Dental Surgeons of Ontario.

SOCIETY PROCEEDINGS.

THE EDUCATIONAL COMMITTEE OF THE ONTARIO DENTAL SOCIETY.

AT the last meeting of the Ontario Dental Society it was provided that once a year the chairmen of the various Educational Committees throughout the Province should meet with the Toronto members of the above committee to discuss ways and means of furthering the oral hygiene campaign.

The first meeting under this arrangement was held in the Dental College on the afternoon of Tuesday, November 7, with Dr. W. Cecil Trotter in the chair. The minutes of the previous meeting were read and the routine business of the committee conducted as usual. Some surprise was expressed at the quantity and variety of the correspondence read by the secretary Dr. R. J., Reade. A great number of enquiries have been received from across the border as to the nature of the work being conducted in Ontario. Copies of the Oral Hygiene Exhibit have also been sent on request to quite a number of the States, as have also pamphlets, outline of lectures, etc.

After the general business meeting an adjournment was made to the Dorothy Jane Tea Rooms, where dinner was served. The evening session was devoted to a general discussion of the methods

to be adopted in carrying out a campaign for mouth health. Dr. R. G. McLaughlin briefly outlined the course that had been followed in arousing interest in Toronto, which has culminated in the establishment of a municipal dental clinic as part of the Health Department, manned by salaried operators. Dr. W. H. Doherty outlined some of the work being done in connection with the Department of Medical Inspection in Toronto public schools.

Dr. J. A. Bothwell of Stratford told of the establishment of medical inspection in Stratford public schools, and Dr. Bennett of St. Thomas outlined the work that has been done by the Elgin Dental Society. Dr. Bennett of St. Thomas touched a vital point when he broached the question of the "Cause and remedy of the apathy of public school teachers."

A resolution was passed asking that the Ontario Dental Society change the name of the committee to "The Ontario Oral Hygiene Committee." The present somewhat meaningless title of the committee has made frequent explanations necessary.

It is to be hoped that the next annual meeting of the committee will bring forth a large attendance of those interested throughout the Province.

THE TORONTO DENTAL SOCIETY.

THE first meeting of the season was held at the Dorothy Jane Tea Rooms on the evening of Tuesday, November 19. The attendance was large and the service the best yet received by the Society.

The programme consisted of papers by Dr. Gowan of Peterboro, Dr. F. C. Husband, Dr. A. W. Ellis, and Dr. A. J. McDonogh of Toronto.

Dr. Gowan's paper dealt with cavity preparation for gold inlays. The butt joint between inlay and tooth was condemned and the wide use of a long bevel advocated. By the use of this long bevel Dr. Gowan held that, by burnishing, a tight joint can be obtained where the various shrinkages and expansions of wax, investment and gold have produced an imperfect adaptation of the inlay to the cavity margins. He deprecated the extensive sacrifice of tooth tissue in cavity preparation and advocated the discarding of the cervical wall, the preparation of the proximal portion of the cavity as a facet by use of a Case disc, and the depending for retention

on a rib on the surface of the inlay, locking in a perpendicular slot in the pulpal wall of the cavity, and a well defined hook at the extremity of the step. Dr. Gowan exhibited a number of cases illustrating the methods advocated.

Dr. A. E. Webster, in opening the discussion, stated that in general he approved the principle outlined by the essayist.

Dr. F. C. Husband in his paper made a plea for the normal restoration of occlusal surfaces. He emphasized its importance from the standpoint of the orthodontist and as the means of restoring the effectiveness of the teeth in mastication. A number of models were shown illustrating the points made in the paper.

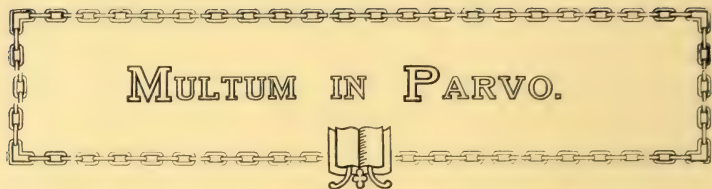
Dr. Grieve drew attention to the fact that in many cases in filling the occlusal cavities the fossae and sulci are filled too full. When the orthodontist restores teeth to their normal positions he often finds it necessary to grind out some of the filling to allow the opposing cusps to lock properly.

Dr. A. V. Ellis' paper on "Excision of Diseased Roots" advocated the excision and removal of a diseased root and the utilizing of the remaining healthy portion. Models illustrating the practice were shown.

Dr. A. J. McDonagh exhibited some skilfully and beautifully made splints for splinting together teeth loosened by pyorrhea.

INLAY OCCLUSION.—To avoid subsequent grinding of the occlusal surface of a cast inlay, place a piece of rubber dam on the wax model before asking the patient to bite down upon it. When you have cemented the finished inlay, you will find, to your delight, that the occlusion is as it should be, without any need to destroy the polish of its surface.

PROPHYLACTIC TREATMENT IN THE APPLICATION OF ARSENIC.—After sealing in an arsenical treatment, the surrounding gum is painted thoroughly with tincture of iodine. This will counteract any tendency towards sloughing in case any of the arsenic escapes, and it also lessens the liability to severe pain, as the counter-irritant effect of the iodine tends to lessen the vascular engorgement of the pulp, thus avoiding so much pressure on the sensory nerve terminals.—C. R. Krause, *Pacific Dental Gazette*.



This Department is Edited by C. A. KENNEDY, D.D.S.

Helpful Practical Suggestions for publication, sent in by members of the Profession, will be greatly appreciated by this Department.

Address. C. A. KENNEDY, D.D.S., 2 College Street, Toronto.

THE ILL-KEPT MOUTH.—The ill-kept mouth is a breeder of disease germs. Through it pass the micro-organisms that produce the diseases from which the human family suffers. It is in the neglected mouth that grow the organisms giving rise to dental caries with all its complications. As a remedy we must prevent the accumulation of debris and the production of conditions that make the mouth a hotbed for the noxious germs of general and contagious diseases like consumption.—Geo. A. Roussell, *Review*.

LOCATING POINTS ON A PLATE PRODUCING IRRITATION.—Upon inserting a plate on the lower jaw, the great number of flat, narrow ones, I say to the patient, "It is far more likely to irritate the gums than an upper set. If it does irritate, you cannot eat. Don't come back with the teeth in your pocket, and say you cannot eat with them, for I tell you now you cannot, but come at once with the teeth in your mouth for a day, so I can see the irritated spot." But while this is readily seen, it is not always easy to locate the exact spot on the plate. To do this place a bit of moist whiting with a spatula, on the spot, place the plate in place, and on removing it, the location is seen. Use a small carborundum stone to relieve it.—L. P. Haskell, *Review*.

LOCATING ROOT CANALS.—When the entrances to the root canals have been temporarily obliterated by the decay having entered the pulp chamber, their whereabouts can be discovered by moistening the floor of the latter with alcohol and drying with warm air. The dentine turns white, but the entrances to the root canals show up as small dark spots, which readily indicate the point of application of the bur or drill.

INSTRUCTION AND REMINDER CARDS.

Essex, Nov. 28th, 1912.

Editor, Oral Health,

Will you kindly send me another batch of those little cards for use amongst the children. I have used the others, I think to good advantage. Our teacher told me that she noticed along with other good results a marked improvement in self respect on the part of some pupils who, not having previously owned a tooth brush, signed the card, obtained the brush and cared for the teeth.

Faternally yours,

C. A. SNELL.

100 neatly printed cards, 3 in. by 4 in. in size, as referred to by Dr. Snell, will be sent without charge to any dentist in Canada, upon receipt of 3 cents in stamps to cover postage.

We have a number of these cards on hand which we would be glad to have practitioners distribute to patients or school children.

If you can use some of these cards to advantage drop us a line and they will be sent by return mail.

Address:—ORAL HEALTH,

Toronto, Canada

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EDITORIAL.

DENTAL INSPECTION OF SCHOOL CHILDREN.

IN a number of places in Ontario, and in other provinces, there are movements on foot, instituted by members of the dental profession, toward dental inspection of school children. The profession is to be congratulated on the fact that in many of these places the first definite move toward the betterment of the health of the child has been taken by the dental profession.

It should be recognized, however, that dental inspection is but a part, though a most important part, of a proper system of medical inspection. The dental aspect of the great child welfare movement will more speedily receive its due recognition as part of a complete system of medical inspection than as a sporadic effort, without the broader view of the needs of the child.

In some places difficulties have been encountered in the attempt to make any advance toward dental inspection. The lack of success in these endeavors may have been due to lack of interest in, or even opposition to, the establishment of dental inspection alone.

We believe the members of the profession will be furthering the interests of the child and advancing the cause of oral hygiene if they endeavor to obtain the co-operation of the medical profession in the establishment of a system of medical inspection of which dental inspection shall be a component part.

The city of Stratford has made what seems to be (for a city or town of small size) an ideal beginning of such a system. A school nurse is employed, who, when she suspects that a physical defect or disease is present, refers the case to the physician or dentist. Such an arrangement, supplemented by suitable instruction to teachers, parents and pupils, is within the scope of the town or city of moderate size. That it is working so successfully in Stratford should encourage other communities to establish some such system.

IN the October Health Bulletin, issued by the Department of Health, Toronto, there is the following comment on the recent meeting in Washington of the International Congress of Hygiene:

“The discussions on some of the problems were remarkable, not so much by the diversity of opinion, but for the general acceptance of ideas, which but a few years ago would have aroused the greatest opposition. For instance, Dr. Chapin, of Providence, Rhode Island, gave a paper on ‘Contact Infection,’ in which he stated that practically all infectious diseases were conveyed from one person to another by the germs present in their mouth and nose secretions being carried directly from the infected person to others. Exceptions, of course, were water or milk borne diseases, where the excretions are conveyed from one infected person to another in this way, or where biting insects convey the Virus. We know that in Toronto there is no more scarlet fever or diphtheria close to our Isolation Hospital than there is anywhere else; in fact, any one who has worked with disease-producing organisms knows that you can handle people with any disease and not contract that disease if you prevent them from coughing or spraying their mouth secretions in your face, and if you wash your hands after handling the patient.”

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